KERR-McGEE OIL & GAS CORPORATION

June 20, 2005

Regional Supervisor, Field Operations
Attn: Mr. Alex Alvarado, MS 5232
Minerals Management Service
1201 Elmwood Park Blvd
New Orleans, LA 70123-2394

Re: Application for a 8" Bulk Gas Right-of-Way Pipeline (Merganser Pipeline) and Umbilical to be Installed in and/or Through Atwater Valley Block 37, Mississippi Canyon Blocks 1005, 1006, 962, 963, 919 and 920 OCS Federal Waters, Gulf of Mexico, Offshore, Louisiana

Gentlemen:

Pursuant to the authority granted to the Secretary of the Interior in 43 U.S.C. 1334(e) and Section 5(e) of the Outer Continental Shelf Lands Act (67 Stat. 462) (43 U.S.C. 1331), as amended (92 Sta. 629), and in compliance with the regulations contained in Title 30, CFR Part 250, Subpart J, Kerr-McGee Oil and Gas Corporation is filing this application in quadruplicate for a right-of-way two hundred (200) feet in width for the construction, maintenance, and operation of a 8-inch bulk gas right-of-way pipeline to be installed in and/or through Atwater Valley Block 37, Mississippi Canyon Blocks 1005, 1006, 962, 963, 919 and 920 OCS Federal Waters, Gulf of Mexico, Offshore Alabama and Louisiana. Kerr-McGee agrees that said right-of-way, if approved, will be subject to the terms and conditions of said regulations. In addition, information related to a proposed electro/hydraulic control umbilical to be laid approximately parallel to the proposed pipeline is included in the application.

The proposed Merganser Pipeline will transport bulk gas from a subsea development located in AT 37 to a proposed floating production platform, Independence Hub, MC 920, Platform A operated by Anadarko Production Company.

The proposed pipeline right-of-way is 67,940.98 feet (12.87 miles) in length. The right-of-way commences at the PLEM 1A located in AT 37 in 7925 feet of water to the SCR touchdown point in MC 920 which is located in approximately 7880 ft of water.

The proposed umbilical is to be installed in and/or through Atwater Valley Block 37, Mississippi Canyon Blocks 1005, 1006, 962, 963, 919 and 920. The proposed length of the umbilical lying on the seabed is 73,159.75 ft (13.86 miles) from the touchdown point in MC 920 in 7895 feet of water to the SUTA in AT 37 in 7925 feet of water.

Enclosed is a check in the amount of $2545 covering the application fee of $2350 as required in 30 CFR 250.1010(b) and the first year's rental of $195 (13 miles at $15/mile) as required in 30 CFR 250.1009(c)(2).

Kerr-McGee Oil and Gas Corporation will be the operator of the pipeline installed in the right-of-way. Kerr-McGee's corporate qualifications have been filed with the Minerals Management Service in New Orleans, as operator 02219. In accordance with 30 CFR 250.1009(b)(1)(i), Kerr-McGee will maintain a $300,000 bond that guarantees compliance with all terms and conditions of the rights-of-way Kerr-McGee holds in the Gulf of Mexico OCS region.

An original and three copies of the completed Nondiscrimination in Employment form are attached.

Kerr-McGee agrees that if archaeological resources should be discovered while conducting operations within the right-of-way, Kerr-McGee shall immediately halt operations within the area of discovery and report the discovery to the Regional Director. If investigations determine that the resource is significant, the Regional Director will inform Kerr-McGee on how to protect the resource.

Kerr-McGee hereby agrees to keep open at all reasonable times for inspection by the Minerals Management Service the area covered by the right-of-way and all improvements, structures, and fixtures thereon and all records relative to the design, construction, operation, maintenance, and repairs, or investigations on or with regard to such area.

The information required in 30 CFR 250.1007 is attached to this cover letter for the pipeline.

In accordance with 30 CFR 250.1010(c), a list of every designated oil and gas lease operator, right-of-way holder and easement holder whose lease, right-of-way or easement is intersected by the proposed pipeline right-of-way is attached. Proof of delivery showing date delivered as evidence of service upon such operators will be forwarded to your office when received. In order to expedite the permitting process, we have requested a letter of no objection from the designated operator. When obtained, these letters will be forwarded to your office.

The proposed pipeline right-of-way does not adjoin or subsequently cross state submerged lands. No safety fairways are crossed.

Kerr-McGee agrees to allow the occupancy and the use by the United States, its lessees, or other right-of-way holders of any part of the right-of-way grant not actually occupied or necessarily incident to its use for any necessary operators involvement in the management, administration, or the enjoyment of such other granted rights.

In accordance with NTL 2002-G15, a consistency certification and supporting documentation has been sent to the states of Alabama and Louisiana. A copy of the consistency certification is enclosed. Proof of delivery will be forwarded to your office.

The anticipated construction start date for the pipeline is March 1, 2006 with completion of all activities scheduled for October 31, 2006.

Kerr-McGee appreciates your review and approval of this application. Please contact our regulatory consultant, Wanda Parker, WJP Enterprises, at 972-516-1177 or wanda.parker@wjpenterprises.com with all questions or comments regarding this application and forward all correspondence to her attention.. Please fax a copy of the approval letter to 972-516-1188 when it is available.

Very truly yours,

Jim W. Bryan
Attorney-in-Fact

PROJECT DESCRIPTION

Kerr-McGee Oil and Gas Corporation is the operator of the Merganser Project which is located in Atwater Valley 37 (OCS-G 21826) and consists of two subsea wells which will be tied back to the proposed Anadarko operator Independence Hub platform located in MC 920 (open). The two wells, AT 37 SS001 and AT 37 SS003, are located in water depths ranging from 7919 to 7933 ft, while the host facility is located at a water depth of 7913 ft. The initial completions are dry gas. The wells will be tied back to the Independence Hub utilizing a single 8-inch bulk gas pipeline and SCR which is the subject of this application, plus a system of rigid infield pipelines, Pipeline End Termination Manifolds (PLEMS), Pipeline End Terminations (PLETS) and rigid jumpers which will be subject of a lease term pipeline application. The pipeline system has been designed with the flexibility to tie in future wells. The subsea wells will be controlled by an electro/hydraulic umbilical which will be laid parallel to the proposed right-of-way pipeline and terminated at a SUTA located in AT 37. An additional electro/hydraulic umbilical will also be from the SUTA SS001 to the AT 37 SS003 which will be included in the application for the lease term pipelines. Please see the attached drawing (3083-50-P-DW-001-REV2) for an overall field layout of the pipeline system.

The installation of the subsea pipelines is currently anticipated to commence in March, 2006 and completed in October, 2006 with first production anticipated in December, 2006.

The proposed project was described in a conceptual Deep Water Operations Plan (CDWOP) which was approved by MMS by letter dated June 8, 2005, and in a Development Operations Coordination Document (DOCD), Control Number N-8407, currently under review by MMS. A preliminary DWOP will be filed shortly. Please refer to those documents for additional general information about the project.

NOTIFICATION

Enclosed is a table showing all of the lease blocks and right-of-use and easements crossed by the proposed pipeline and umbilical. A copy of this application will be sent to each operator of the lease block or right-of-use and easement crossed. MMS will be furnished with a copy of each proof of notification. Letters of no objection have been requested. These will be furnished to MMS when obtained.

COASTAL ZONE CONSISTENCY CERTIFICATION

In accordance with NTL 2002-G15, please find enclosed a copy of the coastal zone consistency certification for the State of Louisiana. A copy of this application with a request for certification has been sent to Coastal Management Division , Department of Natural Resources for the State of Louisiana. Proof of delivery will be provided to MMS. A copy of their concurrence letter will be provided to MMS when obtained.

PLATS

A plan and profile pipeline route maps for the single bulk gas ROW pipeline and umbilical has been prepared in accordance with the LTL dated April 18, 1991. In accordance with NTL 98-09, diskettes are provided with the digital data.

SCHEMATIC

A schematic diagram is enclosed showing the safety system for the pipeline system. See drawings 3083-50-J-DW-001 and 3083-50-J-DW-003.

METHOD OF INSTALLATION

A dynamically positioned installation vessel will be used to install the proposed pipeline and umbilical. The SCR will be hung off from a flex joint on a porch located on the Independence Hub pontoon.

ONSHORE BASE

Support activities during the installation and operational life of the pipelines will be from Kerr-McGee's existing shorebases in either Cameron or Fourchon, Louisiana. No new facilities or personnel will be required for these activities.

WORST CASE DISCHARGE

The initial bulk gas to be transported in the proposed right-of-way pipeline is very dry, 1 BC/MMCF. The pipeline has been designed to transport a maximum of 250 MMSCFD and 550 BCPD. The pipeline boarding shut down valve on the host platform will close within 45 seconds of being signaled to close. The subsea well will start its shutdown sequence immediately upon being signaled to close. The Production Isolation Valve and Choke will close immediately, effectively shutting off flow from the well, with the Production Wing Valve closing within 4 minutes of being signaled to close. The Production Master Valve will close within 20 minutes. The maximum discharge from a break in the pipeline is estimated at 37 barrels.

ARCHAEOLOGICAL, CHEMOSYNTHETIC AND SHALLOW GEOHAZARD ASSESSMENT

A site specific archaeological, engineering and hazard survey and report was conducted by C&C Technologies for the proposed pipeline system and umbilicals along the proposed route from AT 37 to MC 920. The survey and report comply with NTL 98-20, 2000-G20 and 2002-G01. Four copies of the survey report are enclosed for your review.

Shallow Hazard Assessment

The surveyed water depths along the proposed route ranged from 7741 ft to 7965 ft. The proposed route traverses through a mostly smooth to moderately undulating seafloor without any significant bathymetric features. Apparent gradients along the majority of the proposed route range from than 0.1° to up to 4.0°. The near seafloor sediments across the survey area are generally very soft hemipelagic clay. Several faults occur in AT 36 and 37, but only one fault

extends across the proposed pipeline route. Mass movement deposits are buried at approximately 92 feet below the seafloor over a portion of the route, but these do not pose any concerns to the installation or integrity of the proposed pipeline. There are no naturally occurring seafloor features that will pose a hazard to the proposed pipeline or umbilical.

There are fifty-six unidentified sonar contacts identified from the side scan sonar data within the survey corridor. These are interpreted as debris associated with lease block development, modern shipping activities or objects of natural origin. The table below identifies 29 unidentified contacts located within 500 ft of either the proposed umbilical or pipeline route. One of these, M5 is located within 100 ft of the proposed pipeline route. Three contacts, M24, M42 and M51 are located within 100 ft of the proposed umbilical route. All unidentified contacts will be avoided during pipelay operations. Prior to commencing the pipelay activities, the unidentified sonar contacts in close proximity to the pipelay activities will be investigated and moved or removed prior to installation activities.

Sonar Contact No.	**OCS Area and Block**	**Coordinate (UTM 16)**		**Description**	**Distance from Proposed Route U-Umbilical P-Pipeline**	**Dimension L X W**
		X	Y			
M1	MC 920	1,322,609	10,192,656	Debris	417’ SE Of U 289’ SE of P	3’ X 4’
M2	MC 920	1,320,864	10,191,303	Debris	2004’ SSW of U 396’ SE of P	5’ X 1’
M3	MC 920	1,320,796	10,191,414	Debris	1907’ SSW of U 265’ SE of P	10’ X 6’
M4	MC 920	1,320,776	10,191,559	Debris	1767’ SSW of U 122’ SE of P	6’ X 12’
M5	MC 920	1,320,742	10,191,650	Debris	1684’ SSW of U 42’ SE of P	6’ X 2’
M6	MC 920	1,320,377	10,191,825	Debris	1574’ SSE of U 312’ NW of P	5’ X 3’
M16	MC 963	1,308,147	10,182,473	Debris	5844’ SE of U 421’ NW of P	6’ X 4’
M17	MC 963	1,308,064	10,182,186	Debris	5967’ SE of U 269’ of P	3’ X 5’
M18	MC 963	1,307,981	10,182,054	Debris	5989’ SE of U 229’NW of P	2’ X 2’
M19	MC 963	1,306,018	10,179,488	Debris	6160’ SE of U 303’ SE of P	3’ X 4’
M21	MC 963	1,301,386	10,176,241	Debris	4740’ SE of U 494’ NW of P	5’ X 5’
M22	MC 962	1,298,563	10,172,405	Debris	5080’ SE of U	2’ X 2’

Sonar Contact No.	OCS Area and Block	Coordinate (UTM 16)		Description	Distance from Proposed Route U-Umbilical P-Pipeline	Dimension L X W
		X	Y			
					378’ SE of P	
M24	MC 962	1,296,870	10,178,134	Debris	76’ SE of U 2961’NW of P	6’ X 2’
M27	MC 1006	1,292,780	10,166,985	Debris	4194’ of U 372’ SE of P	4’ X 3’
M28	MC 1006	1,292,780	10,165,985	Debris	244’ NW of U 4,395’ NW of P	4’ X 3’
M29	MC 1006	1,289,809	10,164,267	Debris	3696’ SE of U 335’ SE of P	1’ X 4’
M30	MC 1005	1,283,025	10,158,702	Debris	2141’ SE of U 240’ NW of P	5’ X 1’
M31	MC 1005	1,282,824	10,158.744	Debris	1961’ SE of U 408’ NW of P	7’ X 3’
M35	MC 1005	1,227,364	10,155,872	Debris	332’ NW of U 2043’ NW of P	3’ X 1’
M37	AT 37	1,227,107	10,153,043	Debris	1308’ SE of U 152’ NW of P	14’ X 9’
M38	AT 37	1,277,029	10,153,249	Debris	1115’ SE of U 356’ NW of P	15’ X 3’
M39	AT 37	1,276,567	10,151,833	Debris	1682’ SE of U 361’ SE of P	5’ X 1’
M40	AT 37	1,276,413	10,151,760	Debris	1612’ SE of U 307’ SE of P	15’ X 8’
M42	MC 1005	1,276,124	10,154,041	Debris	88’ NW of U 1554 NW of P	13’ X 6’
M43	MC 1005	1,275,855	10,154,034	Debris	288’ NW of U 1733’ NW of P	7’ X 1’
M45	MC 1005	1,275,274	10,154,505	Debris	730’ SE of U 341’ NW of P	6’ X 6’
M46	AT 37	1,274,083	10,150,359	Debris	747’ SE of U 259’ NW of P	3’ X 1’
M50	AT37	1,272,058	10,149.407	Debris	176’ NW of U 950’ NW of P	7’ X 2’
M51	AT37	1,271,819	10,148,944	Debris	59’ NW of U 776’ NW of P	4’ X 1’

There are three wellheads in AT 37 that exist in the survey area. These will be avoided during installation activities. There are no pipelines or any other manmade facilities existing within the survey area.

Deepwater Chemosynthetic Communities

The proposed pipelines are located in water depths greater than 400 meters; therefore, there is the possibility of chemosynthetic communities to be present. Please see the map included in the shallow hazard report referenced above which shows bathymetry, seafloor and shallow geological features and areas that could be disturbed by the proposed pipeline activities and the route of the proposed pipelines and umbilical. A dynamic lay barge will be used; therefore, no anchors are proposed to be utilized. No faults or subsea vents were noted along the pipeline route; therefore, the potential for chemosynthetic communities is low.

In accordance with NTL 2000-G20, the following summary statement is provided:

(1) NO DISTURBANCES WITHIN 500 FEET OF CHEMOSYNTHETIC COMMUNITIES

- Features or areas that could support high-density chemosynthetic communities are not located within 500 feet of any seafloor disturbances resulting from our proposed pipeline and umbilical construction (including those caused by anchors, anchor chains, and wire ropes, if applicable).

Archaeological Assessment

The geophysical data was reviewed for evidence of potential submerged cultural resources. Available shipwreck databases list two modern vessels and one historic vessel reported to have been lost in the proximity of the project area. The M/V Star of Peace was reported lost in 1975 near AT 345. The fishing vessel Hunter was reported lost in 1987 near AT 37. The schooner Nokomis was reported to have foundered near MC 1088 in 1905. Although 56 unidentified sonar contacts were identified by the survey, none of these targets are suggestive of a submerged cultural resource. No sonar contacts are planned to be avoided due to archaeological concerns.

Marking Of Hazards

In lieu of the requirement to buoy all existing pipelines and other potential hazards within 150 meters (490 feet) of the operation as required in NTL 98-20, a state-of-the-art positioning system (e.g. differential global positioning systems) will be utilized on the pipeline laying vessel to ensure any hazards are avoided. A plat with a minimum scale of 1:12,000 depicting the location of the proposed activity, any existing pipelines and other hazards, including unidentified sonar contacts, in the area will be provided to the key personnel on the pipeline-lay barges and anchor-handling vessels associated with the operations.

PIPELINE CROSSINGS, SUBSEA TAPS AND VALVES

No pipelines are planned to be crossed by the proposed pipeline or umbilical in this plan.

BURIAL REQUIREMENTS

The pipeline will be installed in water depths greater than 200 feet; therefore, jetting or burial is not required.

FAIRWAY OR ANCHORAGE AREA CROSSINGS

No fairways or anchorage areas will be crossed by the proposed pipelines; therefore, a Corps of Engineers permit will not be required.

PRODUCT TO BE TRANSPORTED

Bulk gas

SPECIFIC GRAVITY OF THE PRODUCT

Specific Gravity is 0.65

MAXIMUM EXPECTED TEMPERATURE

The design temperature for the pipeline is 140°F.

MAXIMUM SOURCE PRESSURE

The maximum source pressure (MSP) is expected to be the maximum SITP of the subsea wells which is expected to be 8570 psi.

DESCRIPTION OF PIPELINE SECTIONS

The following pipeline sections are contained in this application.

Pipeline Section	Approximate Length (feet)	Material	Grade	O. D. (in)	I. D. (in)	W. T. (in)
Rigid Steel Pipeline	64,000	Steel, SMLS	X-65	8.625	7.906	.719
SCR	9,000	Steel, SMLS	X-65	8.625	7.675	0.950
Flex Joint						
Umbilical*	1 X 82,000	Super Duplex		5.1	--	--

* Please see the enclosed data sheet for details on the umbilical.

RISER PROTECTION

The pipeline SCR will be hung off a porch located on the Independence Hub semi-submersible pontoon using a flex joint. The piping above the SCR will be located within the platform structure; therefore, no riser guards will be utilized.

The umbilical will be installed through a pull tube.

MARINE CATHODIC PROTECTION SYSTEM

Rigid Steel Pipe

Cathodic protection calculations were based on DnV RP F103 for a 20 year life.

Sacrificial anodes will be attached to the rigid steel pipelines during the installation phase. The anodes will be aluminum alloy half shell bracelet anodes (Galvalum III or equivalent).

A temperature profile was used to determine the maximum operating temperatures of the flowlines. Increased temperature decreases the electrochemical capacity of the anodes thus requiring more anode mass in the area of increased temperature. Anode dimensional and spacing requirements for 45, 100, and 150 °F have been determined. These temperatures correspond to specific sections of each of the flowline. The required anode spacing and dimensions are shown in the table below:

Temperature, °F	**45**	**100**	**150**
Anode Spacing, ft	480	480	280
Anode Thickness, in	1.5	1.5	1.5
Gap between half shells, in	4	4	4
Nominal Anode Length, in	20	20	20
Nominal Anode Mass, lb	72.7	72.7	72.7

SCR

Cathodic protection will be provided for the SCR for a 30 year life. Due to the need to limit the weight of the SCR and due to the installation of urethane strakes on the SCR, cathodic protection will be provided by anodes mounted on the Independence Hub as well as bracelet anodes placed on the SCR in the touchdown region. The hull mounted anodes will be located on a "sled" mounted on the inboard side of the hull pontoon. The sled will have insulators in the frame to electrically isolate it from the hull. A marine cable will be used to connect the anode sled to the SCR. To determine the amount of anodes to be placed on the hull to protect the SCR, the calculation methods in DNV RP B401 were utilized. These calculations show that a total of 7250 lbs of Al-Zn-In anodes will be necessary. Ten, 725 lb anodes will be located on the sled mounted to the hull to protect the SCR.

In addition to the hull mounted anodes, bracelet anodes on the pipeline in the area of the touchdown region will also be utilized. DNV RP F-103 was utilized to calculate the amount of anodes needed. These calculations show that 175 lbs of Al-Zn-In anodes will be needed. Five anodes spaced 400 ft apart will be provided in the touchdown region of the SCR.

EXTERNAL PIPE COATING SYSTEM

Rigid Steel Pipe

The pipeline will be coated with FBE 0.016 in thick with a density of 87 lb/ft^3.

SCR:

With the exception of the touchdown region, the SCR will be coated with FBE 0.016 in thick with a density of 87 lb/ ft^3. In the touchdown region, a 3-layer FBE 0.1 in thick with a density of 87 lb/ft^3 will be utilized.

INTERNAL COATING OR PROTECTIVE MEASURES

There will be no internal coatings applied to the interior bore of the proposed pipeline.

Internal corrosion is not expected to be a problem. However, provisions have been made by adding a 0.0625 -inch corrosion allowance to the rigid steel pipeline walls and provisions have been made for injecting chemical corrosion inhibitor through the wellhead via the control umbilical should such measures become necessary.

SPECIFIC GRAVITY

Pipeline Section	Air Weight Empty, (lb/ft)	Submerged Weight (lb/ft)	Specific Gravity Empty
Rigid Steel Pipeline (Bare Pipe)	60.77	34.8	2.34
SCR (Bare Pipe)	77.94	51.97	3.00

MAXIMUM ALLOWABLE OPERATING PRESSURE & CALCULATIONS

The proposed MAOP at the top of the 8" SCR is 8,000 psi. The hydrostatic head of the product (dry gas, density 19.9 lbs per cubic foot) within the SCR at the maximum shut-in pressure is approximately 1,100 psi. Therefore, the MAOP at the bottom of the 8" SCR and the 8" main flowline is 9,100 psi, which is greater than the anticipated maximum SITP of the wells of 8570 psi at the mudline.

Rigid Steel Pipeline Design Pressure:

$$Pi - Pe = \frac{2 \times S \times (t - ca)}{D} \times F \times E \times T$$

Pi = Internal pressure, psi
Pe = External hydrostatic pressure, psi = 3493 psi at 7860 ft
S = SMYS = 65,000 psi
t = wall thickness = 0.719 in
ca = corrosion allowance = 0.0625 in
D = outside diameter = 8.625 in
F = design utilization factor = 0.72 for pipelines and PLEM piping
E = longitudinal joint factor = 1.0 for API 5L seamless line pipe
T = temperature derating factor = 1.0 (Max. Temp. = 140 ^{o}F)

$$Pi - 3493 = \frac{2 \times (65000) \times (0.719 - 0.0625)}{8.625} \times 0.72 \times 1 \times 1$$

Pi = 10,617 psig

SCR Design Pressure (at the top of the SCR)

$$P = \frac{2 \times S \times (t - ca)}{D} \times F \times E \times T$$

S = SMYS = 65,000 psi
t = wall thickness = 0.9500 in
ca = corrosion allowance = 0.0625 in
D = outside diameter = 8.625 in
F = design utilization factor = 0.72 for pipelines
E = longitudinal joint factor = 1.0 for API 5L seamless line pipe
T = temperature derating factor = 1.0 (Max. Temp. = 140 ^{o}F)

$$P = \frac{2 \times (65000\,psi) \times (0.9500in - 0.0625in)}{8.625in} \times 0.72 \times 1 \times 1$$

P = 9631 psig

Fittings, Valves and FlangesDesign Pressure
All fittings, valves and flanges are rated for 10,000 psi API.

FIELD HYDROSTATIC PRESSURE TESTING CERTIFICATION
The hydrotest pressure must be equal or greater than 1.25 times the design pressure differential at any point along the flowline taking into account the external water pressure and the weight of the gas. The hydrotest pressure value is greatest when calculated at the top of the SCR.

After installation, both the SCR and main flowline will be hydrostatic tested together from the platform to a test pressure of 1.25 x MAOP (8,000 at the top of the SCR). The external pressure from seawater varies from approximately 3,500-psi at the SCR touch down point (7,900 ft), to approximately 3,550-psi at the maximum water depth (8,000-ft), to approximately 3,450-psi at the minimum water depth (7,800-ft), to approximately 3,500-psi at the wells (7,900-ft). The internal hydrostatic test pressure at the bottom of the riser and at the start of the flowline is the test pressure plus the hydrostatic head of seawater (13,500-psi).

Hydrostatic Test Media:		Sea Water
Test Duration:		8 Hours Minimum
Hydrostatic Test Pressure:	(HTP)	10,000 PSIG at the platform

Calculation:

HTP = 1.25 x Lowest Maximum Design Pressure
HTP = 1.25 x 8000
HTP = 10,000 PSIG

DESIGN CAPACITY
The approximate maximum flow rate through the pipeline is 250 MMCFPD and 550 BCPD.

UMBILICAL DETAILS
Control and monitoring of the subsea wells will be through an electro / hydraulic umbilical designed to accommodate 3 to 4 wells. The umbilical will be installed with an umbilical termination assembly and will be connected to the subsea trees by flying leads. Please see the enclosed data sheet on the umbilical.

CONSTRUCTION INFORMATION AND SCHEDULE

1. Flowline Installation March 1, 2006 to April 1, 2006
2. SCR Hang off August 2006
3. Flowline pressure testing, dewatering and commissioning October 2006.
4. Number of Construction Days 30

ADDITIONAL DESIGN CONSIDERATIONS

Buckle Arrestor

In the unlikely event of a local pipe collapse, the external pressure can cause a buckle to travel (propagate) along the flowline. The minimum pressure that can sustain buckle propagation is known as the propagation pressure, *Pp*. Buckle arrestors are recommended when the external pressure is greater than the propagation pressure. For the Merganser pipeline, the external pressure is greater than the propagation pressure for the entire length of the pipeline; therefore, full length integral ring buckle arrestors will be used. The buckle arrestors were designed in accordance with API RP 1111.

Spanning

Allowable free spans were calculated based on avoiding in-line and cross-flow vortex induced vibration (VIV) for the operational and installation cases and on meeting code-defined longitudinal stress and von Mises stress limits for the operational, installation and hydtrotest cases.

The maximum pipeline span length was determined to be 48 ft and the controlling case was the VIV in-line case. A post installation survey will be conducted. If necessary, engineering solutions will be utilized to mitigate any spans which exceed the maximum allowable length.

Collapse

Pipe collapse pressure (P_c) due to external pressure is calculated using the equations in API RP 1111 (1999).

$$P_c = \frac{P_y \, P_e}{\sqrt{P_y^{\,2} + P_e^{\,2}}}$$

$$P_y = \frac{2(S)\,t}{D}$$

$$P_e = 2\,E\,\frac{(t/D)^3}{(1-\nu^2)}$$

Then the following condition must be satisfied:

$$P_c > \frac{P_{hmax}}{F_c}$$

Where:

E	= Pipe elastic modulus
ν	= Pipe poisson's ratio
P_{hmax}	= Hydrostatic pressure at maximum water depth
F_c	= 0.7 for seamless pipe

Calculations:

$$P_y = \frac{2 \times (65{,}000\ psi) \times (0.719" - 0.0625")"}{8.625"} = 9895\ psi$$

$$P_e = 2 \times (29{,}000{,}000\ psi) \times \frac{\{(0.719" - 0.0625") / 8.625"\}^3}{(1 - 0.3^2)} = 28{,}107\ psi$$

$$P_c = \frac{(9895\ psi) \times (28{,}107\ psi)}{\sqrt{(9895\ psi)^2 + (28107\ psi)^2}} = 10{,}005\ psi$$

$$\frac{P_{h\max}}{F_c} = \frac{(7933\ ft) \times \left(64 \frac{lb}{ft^3}\right)}{\left(144 \frac{in^2}{ft^2}\right) \times 0.7} = 5037\ psi$$

$$P_c = 10{,}005\ psi > \frac{P_{h\max}}{F_c} = 5037\ psi \qquad \therefore OK$$

SCR VIV AND VIM CONSIDERATIONS

The SCR will have 16D by 0.25D type strakes installed in order to mitigate vortex induced vibrations (VIV) and vortex induced motions (VIM). The fatigue performance of the SCR will be considered for the fatigue sea states and for long and short term current events. The following cases will be evaluated.

- 100 year Loop current;
- 50 year Loop current;
- 10 year Loop current;
- 1 year Loop current;
- 100 year Submerged current;
- 100 year Bottom current;

A safety factor of 20 X operational life will be utilized for the minimum fatigue life due to VIV and a safety factor of 10 X operational life will be utilized for VIM. .

CONTACT PERSON

Wanda Parker
Or c/o Kerr-McGee Oil and Gas Corporation
16666 Northchase
Houston, TX 77060
972-516-1177 (office)
972-679-5554 (cell)
972-516-1188 (fax)
wanda.parker@wjpenterprises.com

or
Cary Bradford
Kerr-McGee Oil and Gas Corporation
16666 Northchase
Houston, TX 77060
281-673-6338 (office)
cbradford@kmg.com

Kerr-McGee Oil and Gas Corporation
Merganser Project
GC 768, 724, 680
AT 37 to MC 920
Right-of-Way Bulk Gas Pipeline and Umbilical

UNITED STATES
DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE
NONDISCRIMINATION IN EMPLOYMENT

As a condition precedent to the approval of the granting of the subject pipeline right-of-way, the grantee, Kerr-McGee Oil and Gas Corporation hereby agrees and consents to the following stipulation, which is to be incorporated into the application for said right-of-way.

During the performance of this grant, the grantee agrees as follows:

> During the performance under this grant, the grantee shall fully comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60-1.4(a)), which are for the purpose of preventing discrimination against persons on the basis of race, color, religion, sex or national origin. Paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended, are incorporated in this grant by reference.

Jim W. Bryan
Attorney-in-Fact

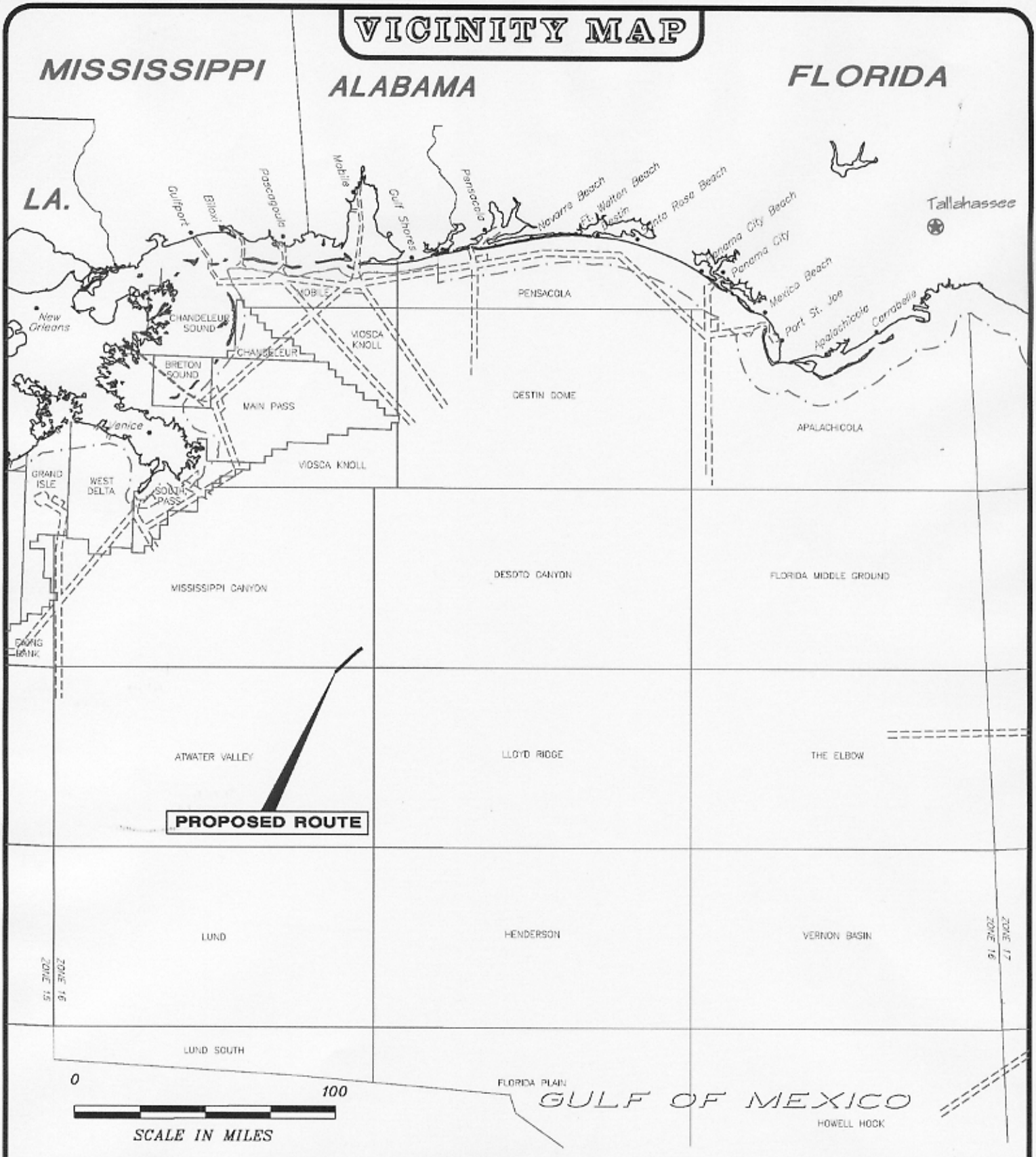
6/15/05
Date

Kerr-McGee Oil and Gas Corporation
Merganser Project
GC 768, 724, 680
AT 37 to MC 920
Right-of-Way Bulk Gas Pipeline and Umbilical

Lease Blocks Crossed
Notification List

Confirmation Number 2300 2730 000 3065 XXXX	Delivery Confirmation	Block	OCS G-	Operator Name	Address	City	State	Zip	Attn
NA	NA	AT 37	21826	Kerr-McGee	16666 Northchase	Houston	TX	77060	
4838		MC 1005	24136	Spinnaker Exploration Company	1200 Smith St, Suite 800	Houston	TX	77002	Mr. Tom Becnel
4845		MC 1006	18320	Chevron USA	1500 Louisiana St	Houston	TX	77002	Mr. Keith Couvillion
4852		MC 962	26282	Petrobras America, Inc	10777 Westheimer, Suite 1200	Houston	TX	77042	Mr. Sloyd Landry
NA	NA	MC 963	Open						
NA	NA	MC 919	Open						
4869	NA	MC 920	Proposed RUE OCS-G 23648	Anadarko Production Co	P. O. Box 1330	Houston	TX	77251-1330	Ms. Susan Hathcock

VICINITY MAP



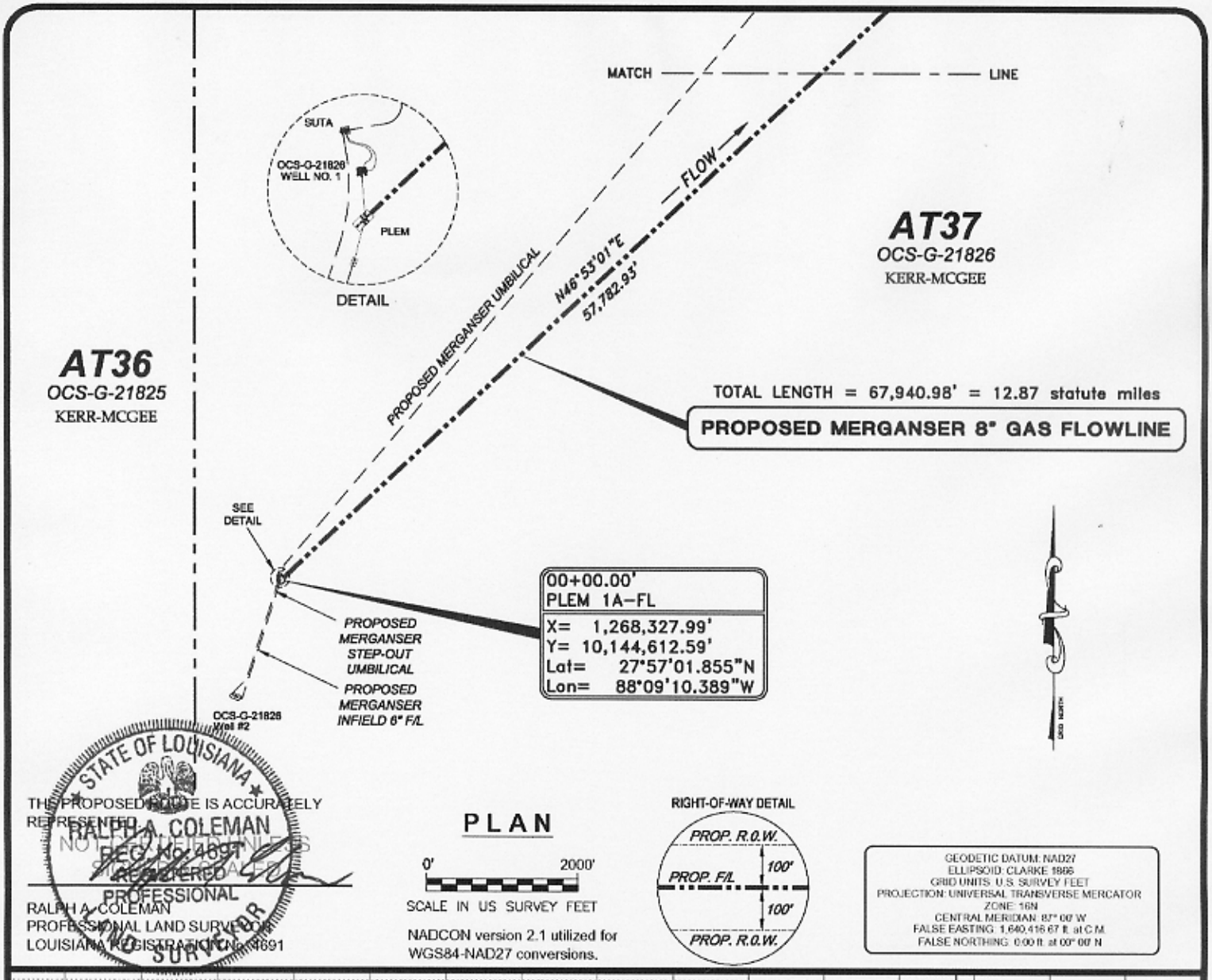
DATE: 06/01/2005 TIME: 17:21 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458CVR.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458CVR.DWG		SHEET 1 of 7



STATE OF LOUISIANA
RALPH A. COLEMAN
REG. No. 4691
REGISTERED PROFESSIONAL SURVEYOR

THIS PROPOSED ROUTE IS ACCURATELY REPRESENTED.
NOT VALID UNLESS SIGNED AND SEALED

RALPH A. COLEMAN
PROFESSIONAL LAND SURVEYOR
LOUISIANA REGISTRATION NO. 4691

PLAN

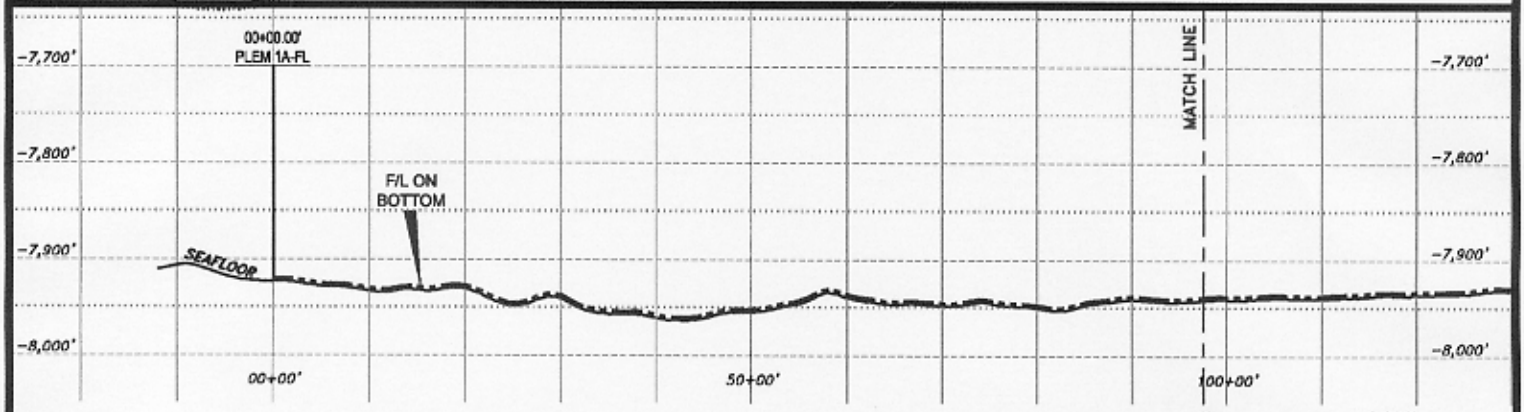
0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

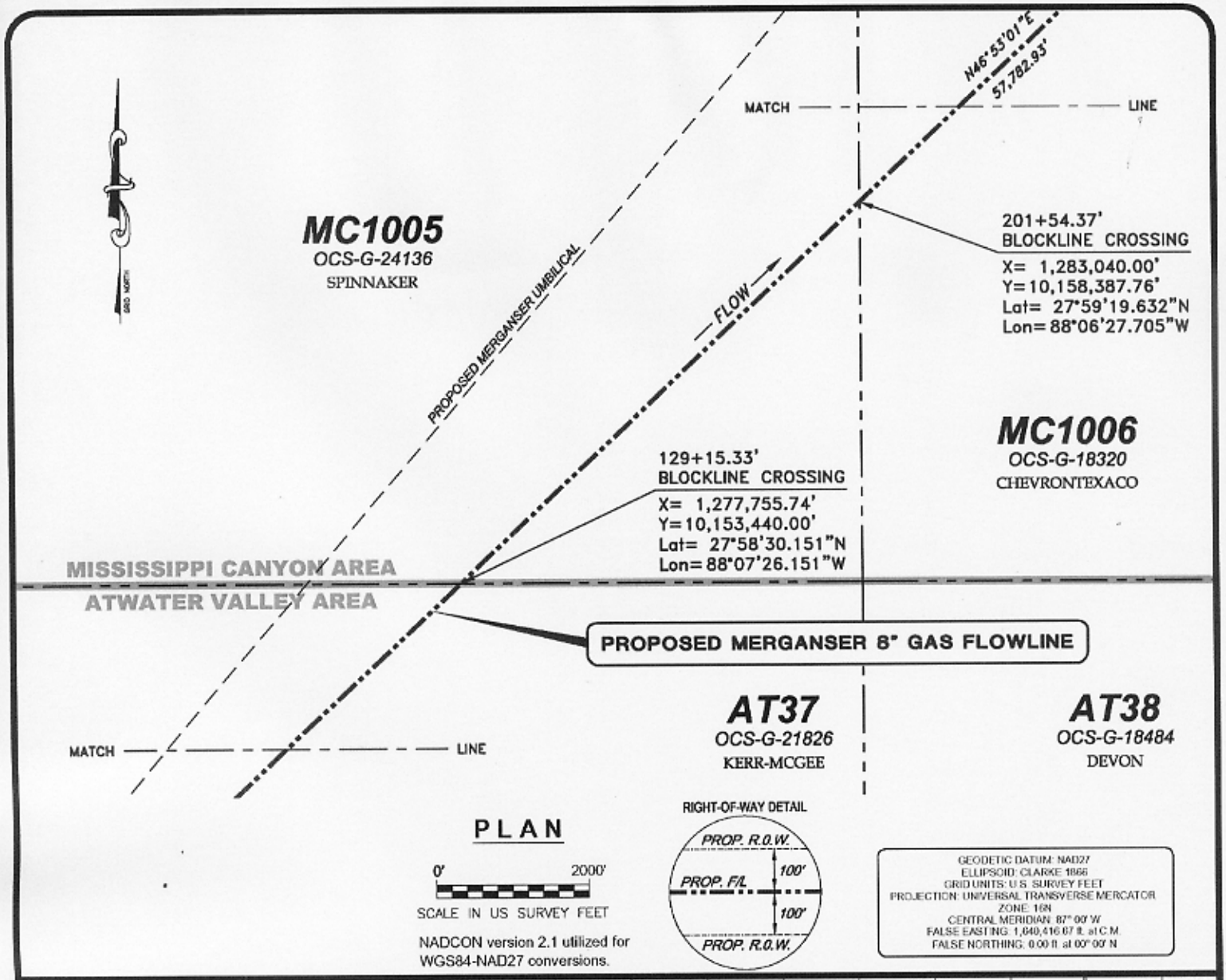
DATE: 05/26/2005 TIME: 17:31 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_F.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind.Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458_F.DWG		SHEET 2 of 7



PLAN

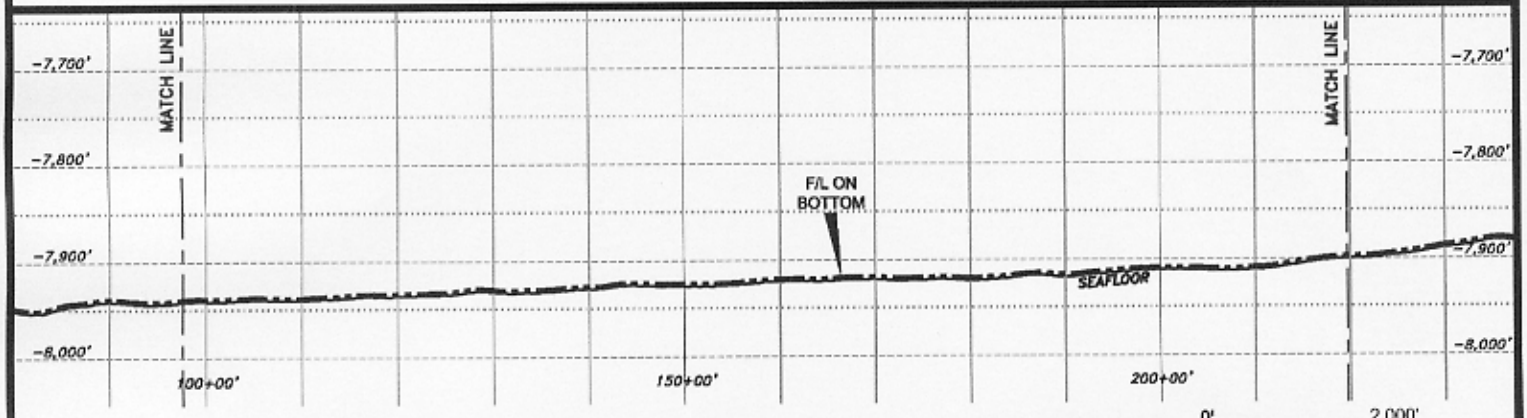
0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

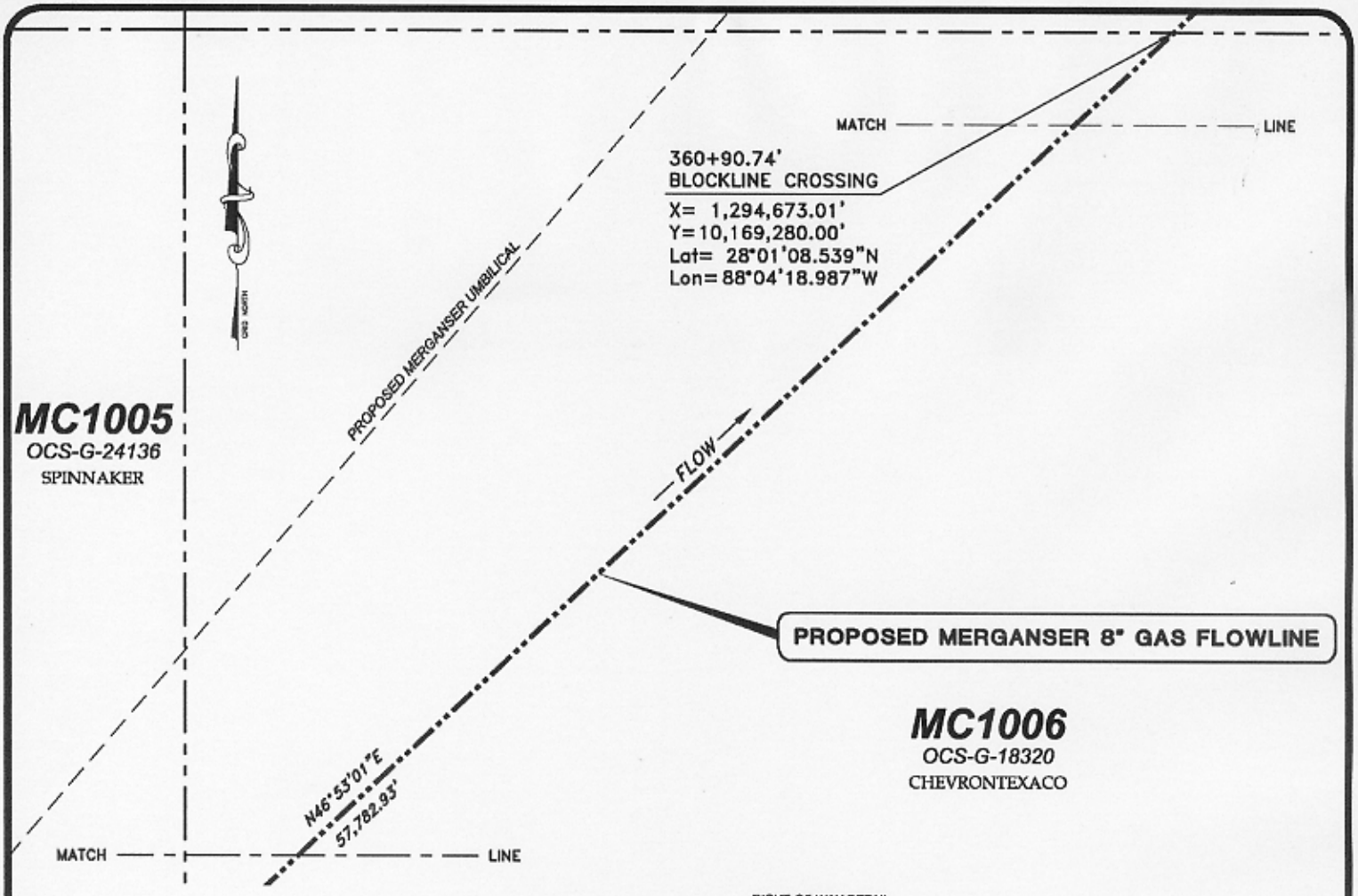
DATE: 05/26/2005 TIME: 17:31 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_F.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind.Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
739 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458_F.DWG		SHEET 3 of 7



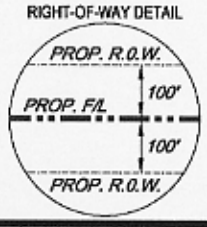
PLAN

0' 2000'

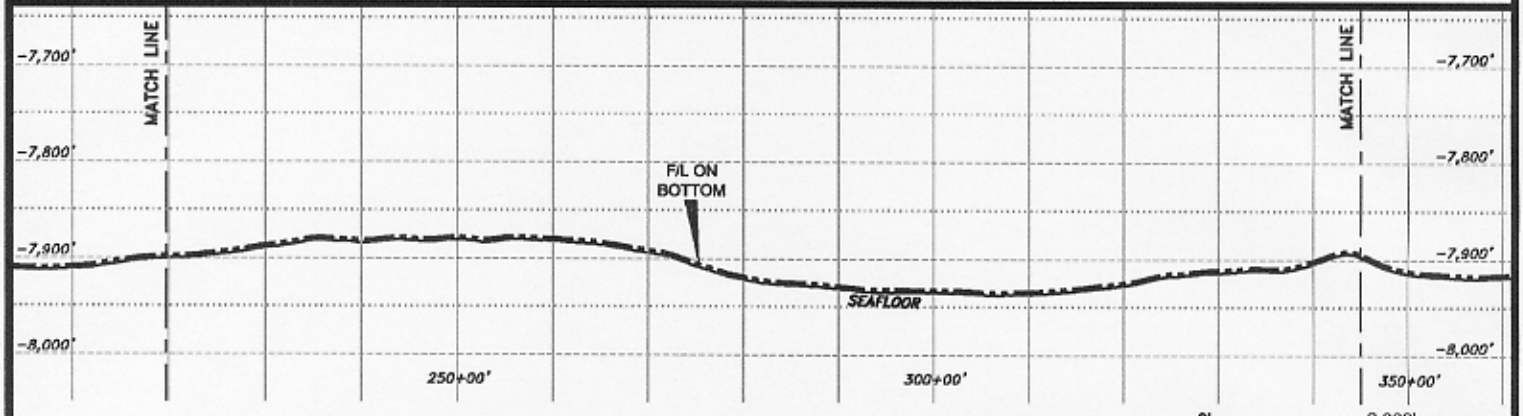
SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'

VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

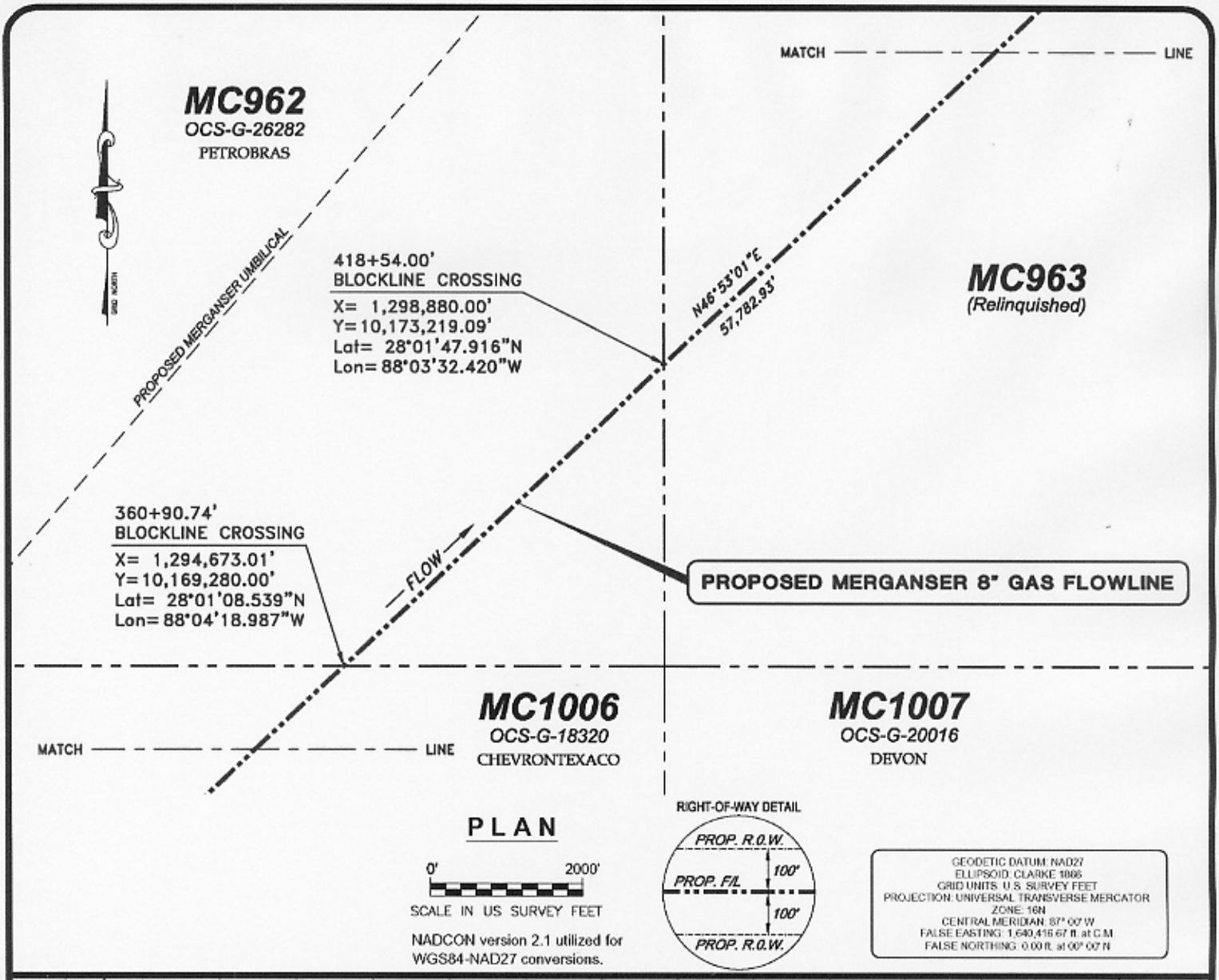
DATE: 05/26/2005 TIME: 17:31 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_F.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind.Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458_F.DWG		SHEET 4 of 7



PLAN

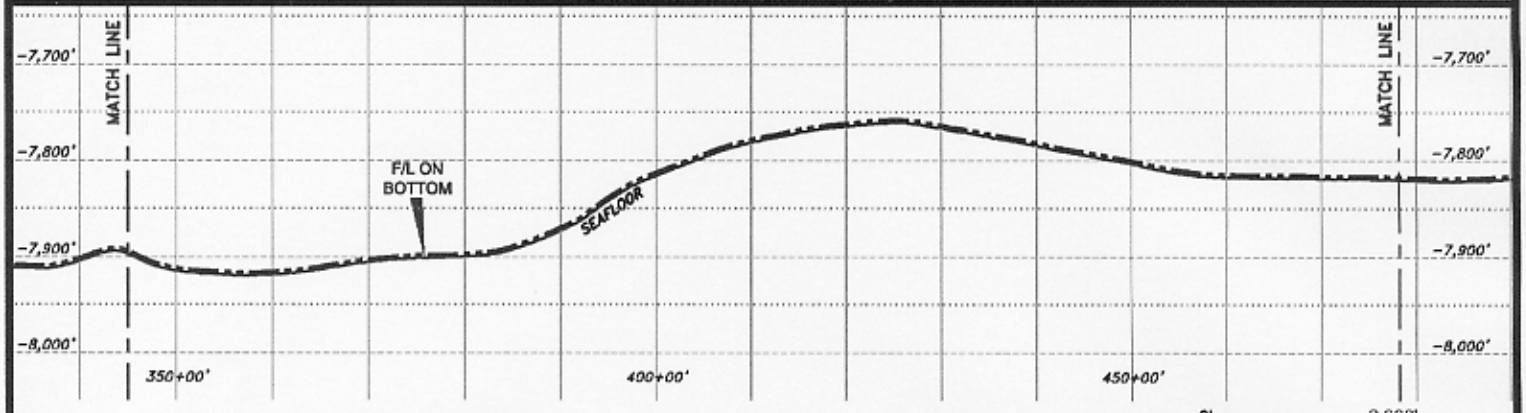
0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

DATE: 05/26/2005 TIME: 17:31 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_F.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind.Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458_F.DWG		SHEET 5 of 7

POINT	STATION	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE
PC1	577+82.93'	1,310,507.56'	10,184,106.25'	28°03'36.729"N	88°01'23.664"W

MC919
(Unleased)

MATCH LINE

PROPOSED MERGANSER UMBILICAL

593+01.81'
BLOCKLINE CROSSING
X= 1,311,638.49'
Y=10,185,120.00'
Lat= 28°03'46.863"N
Lon=88°01'11.133"W

CURVE 1 DATA
PI 1
X= 1,312,320.22'
Y= 10,185,803.46'
R= 35,000.00'
T= 2,483.18'
Δ= 08°06'59"
L= 4,958.05'

PC1

N46°53'01"E
57,782.93'

FLOW

MC963
(Relinquished)

PROPOSED MERGANSER 8" GAS FLOWLINE

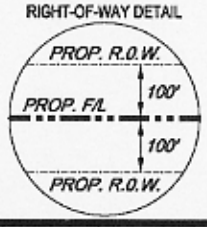
MATCH LINE

PLAN

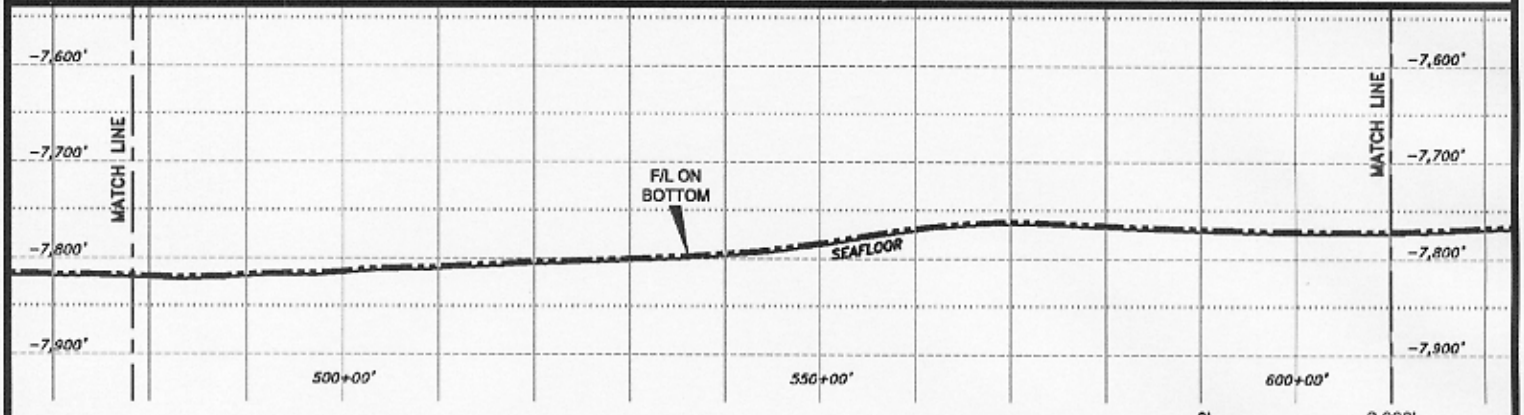
0' 2000'
SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

DATE: 05/26/2005 TIME: 17:31 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_F.DWG

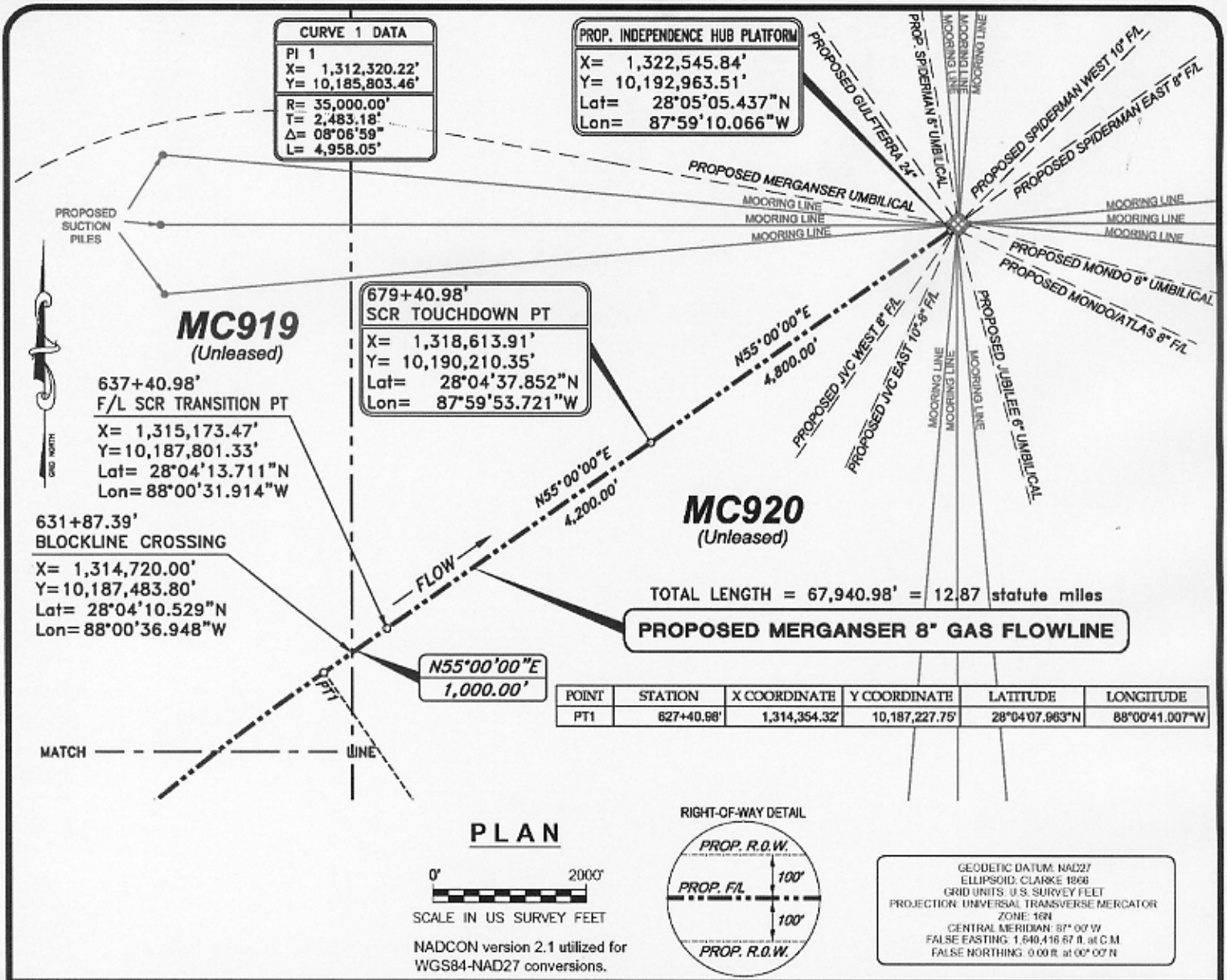
VERTICAL EXAGGERATION = 10

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind.Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0690

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458_F.DWG		SHEET 6 of 7



POINT	STATION	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE
PT1	627+40.98'	1,314,354.32'	10,187,227.75'	28°04'07.963"N	88°00'41.007"W

PLAN

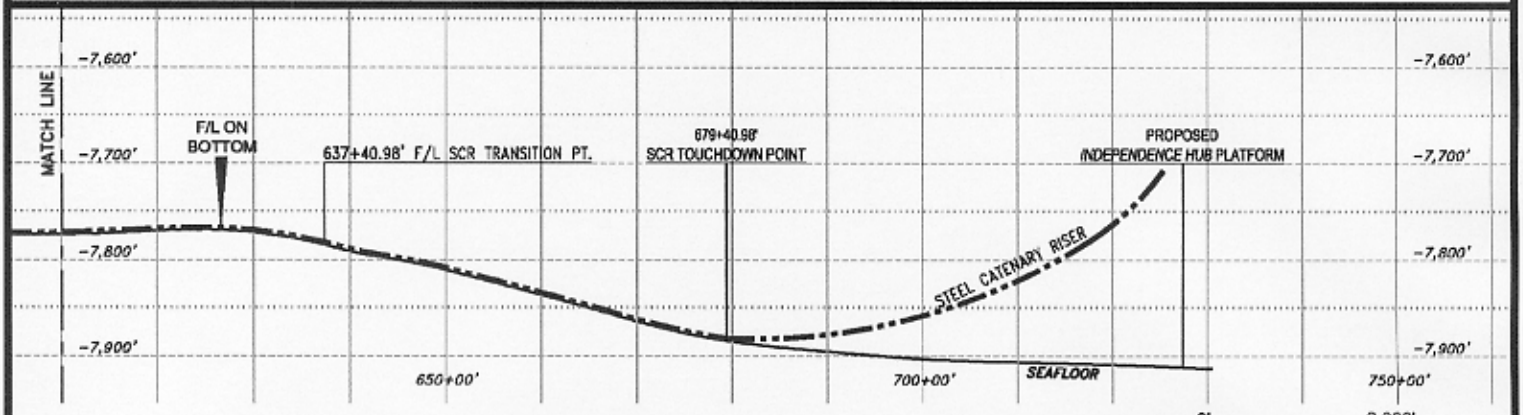
0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'

VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

DATE: 05/26/2005 TIME: 17:31 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_F.DWG

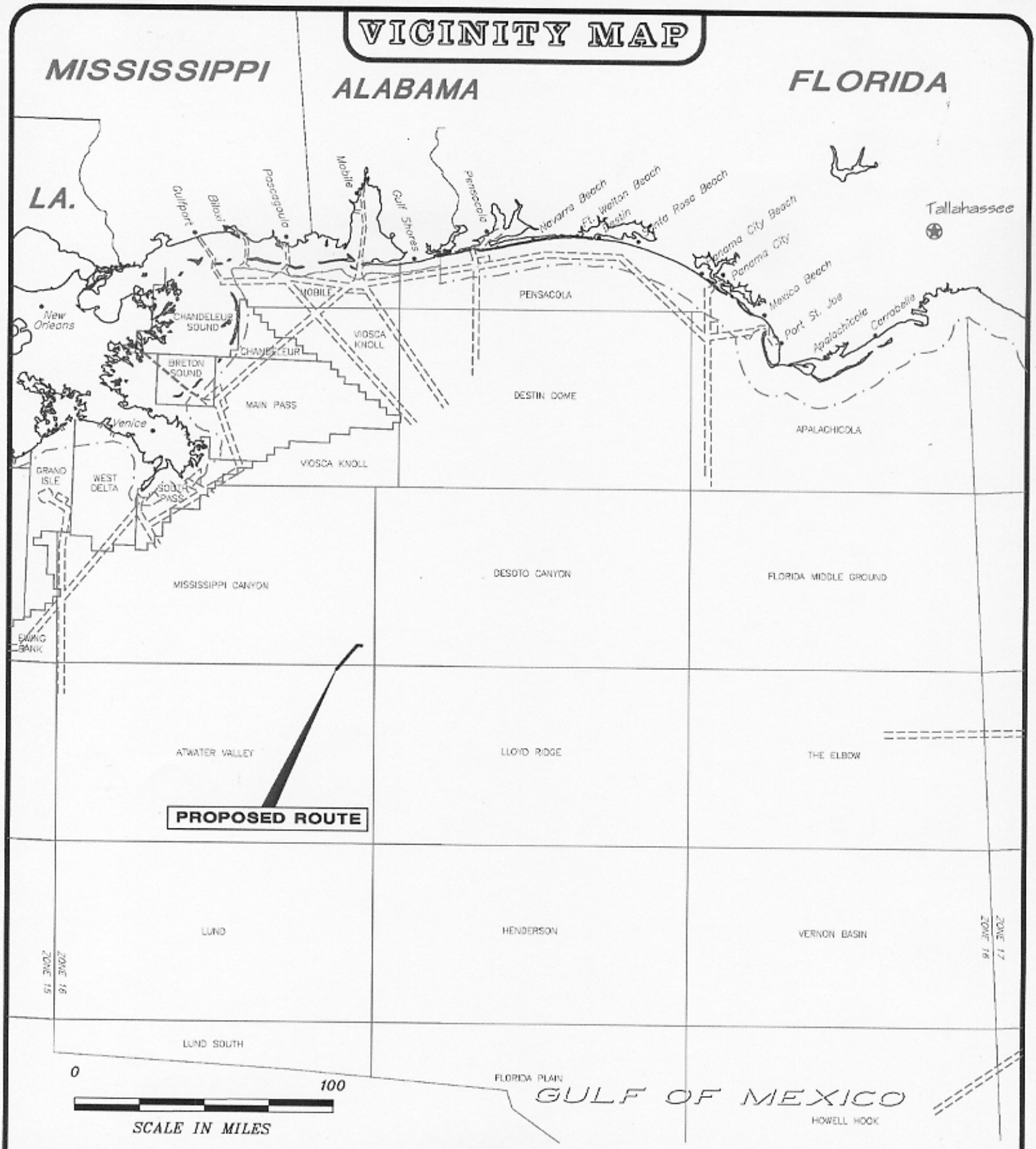
KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER 8" GAS FLOWLINE
Block 37 PLEM 1A-FL, Atwater Valley Area
to
Block 920 Prop. Ind.Hub Platform, Mississippi Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/1/2005	DATE: May 18, 2005
FILENAME: PRM7458_F.DWG		SHEET 7 of 7

VICINITY MAP



DATE: 06/14/2005 TIME: 11:35 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458CVR.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES 730 E. VERMILION BAYOU ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589
FILENAME: PRM7458CVR.DWG
REVISED: 6/14/2005
DATE: May 18, 2005
SHEET 1 of 8

POINT	STATION	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE
PC1	39+84.40'	1,314,842.49'	10,194,395.52'	28°05'18.994"N	88°00'36.221"W

MC920
(Unleased)

MC919
(Unleased)

41+08.58'
BLOCKLINE CROSSING
X= 1,314,720.00'
Y=10,194,415.91'
Lat= 28°05'19.186"N
Lon=88°00'37.591"W

00+00.00'
TOUCHDOWN POINT
X= 1,318,766.36'
Y= 10,193,703.63'
Lat= 28°05'12.462"N
Lon= 87°59'52.339"W

PROP. INDEPENDENCE HUB PLATFORM
X= 1,322,481.55'
Y= 10,193,048.54'
Lat= 28°05'06.274"N
Lon= 87°59'10.792"W

N80°00'00"W
730.59'

FLOW
N80°00'00"W
3,253.81'

N80°00'00"W
3,772.50'

PC1

MATCH LINE

PROPOSED SUCTION PILES

MOORING LINE

PROPOSED GULFTERRA 24"

PROPOSED SPIDERMAN 6" UMBILICAL

PROPOSED SPIDERMAN WEST 10" F/L

PROPOSED SPIDERMAN EAST 8" F/L

PROPOSED MERGANSER 8" F/L

PROPOSED JVC WEST 8" F/L

PROPOSED JVC EAST 10"&8" F/L

PROPOSED JUBILEE 6" UMBILICAL

PROPOSED MONDO 6" UMBILICAL

PROPOSED MONDO/ATLAS 6" F/L

CURVE 1 DATA
PI 1
X= 1,311,179.20'
Y= 10,195,041.45'
R= 6,500.00'
T= 3,719.80'
Δ= 59°33'47"
L= 6,757.21'

7+30.59'
STATIC/DYNAMIC TRANSITION POINT
X= 1,318,046.87'
Y=10,193,830.50'
Lat= 28°05'13.660"N
Lon=88°00'00.385"W

PROPOSED MERGANSER UMBILICAL

TOTAL LENGTH = 73,159.75' = 13.86 statute miles

STATE OF LOUISIANA
RALPH A. COLEMAN
REG. No. 4691
REGISTERED PROFESSIONAL LAND SURVEYOR

THE PROPOSED ROUTE IS ACCURATELY REPRESENTED

RALPH A. COLEMAN
PROFESSIONAL LAND SURVEYOR
LOUISIANA REGISTRATION No. 4691

PLAN

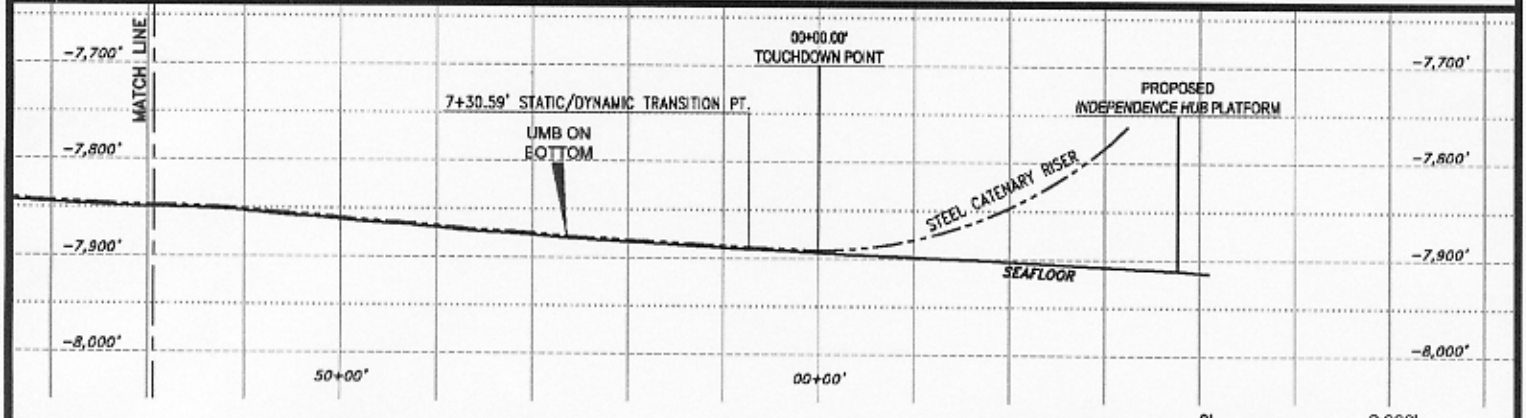
0' 2000'
SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

PROP. R.O.W.
100'
PROP. UMB
100'
PROP. R.O.W.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'
VERTICAL EXAGGERATION = 10

DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

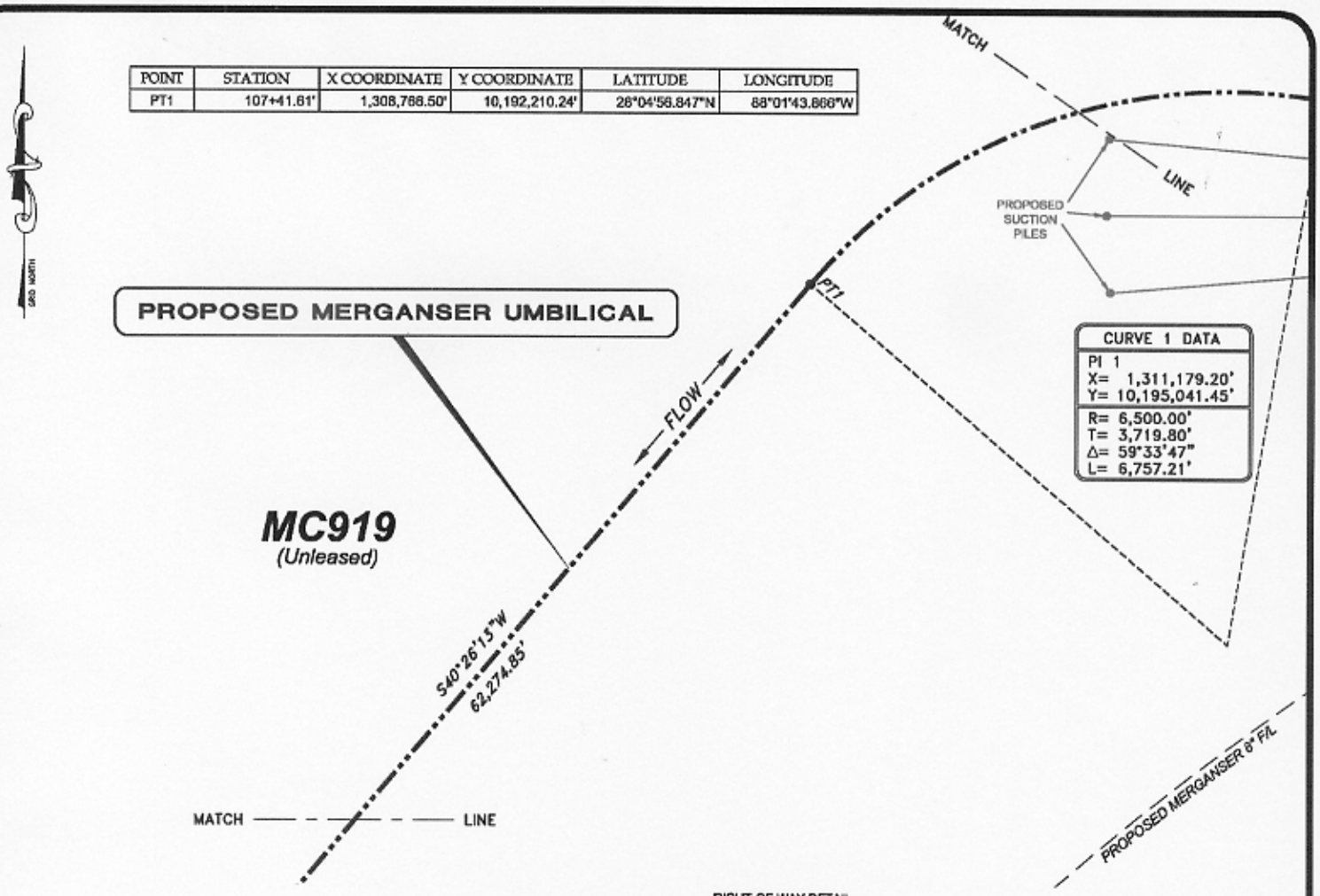
KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. VALIDATE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589
FILENAME: PRM7458_U.DWG
REVISED: 6/14/2005
DATE: May 18, 2005

POINT	STATION	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE
PT1	107+41.61'	1,308,788.50'	10,192,210.24'	28°04'56.847"N	88°01'43.866"W



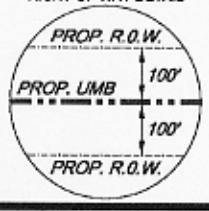
PLAN

0' 2000'

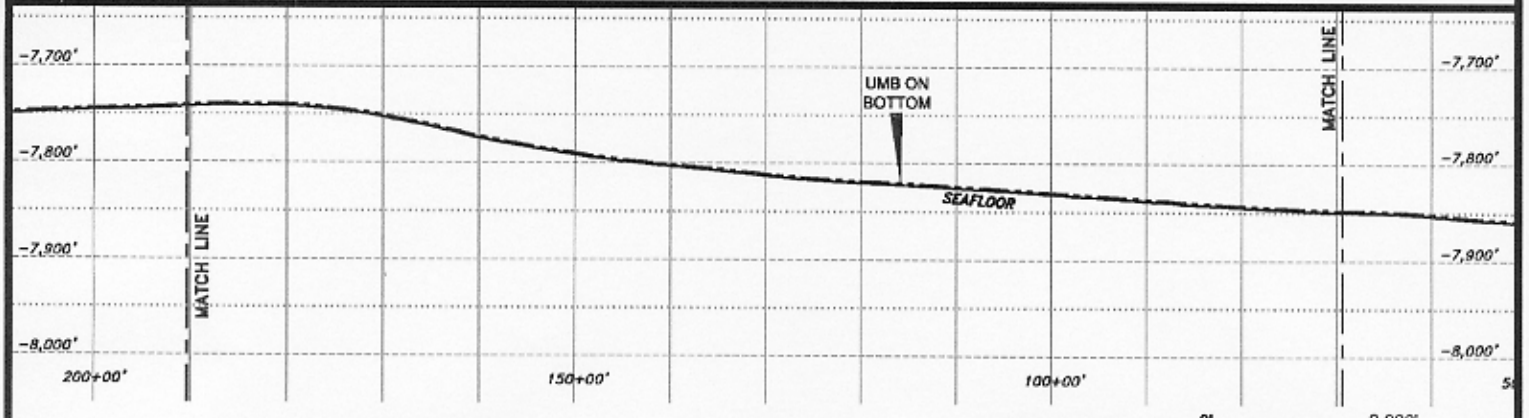
SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

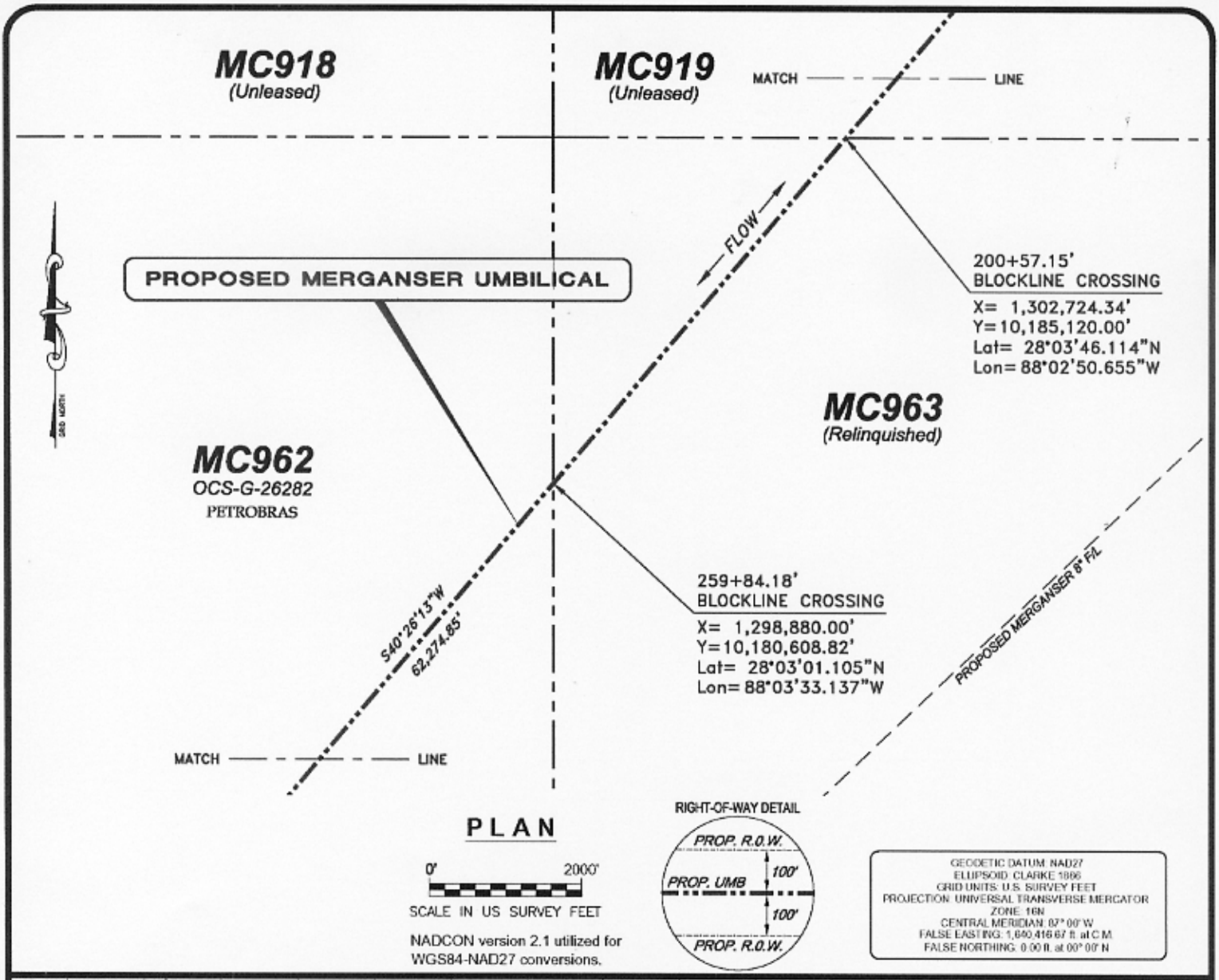
PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

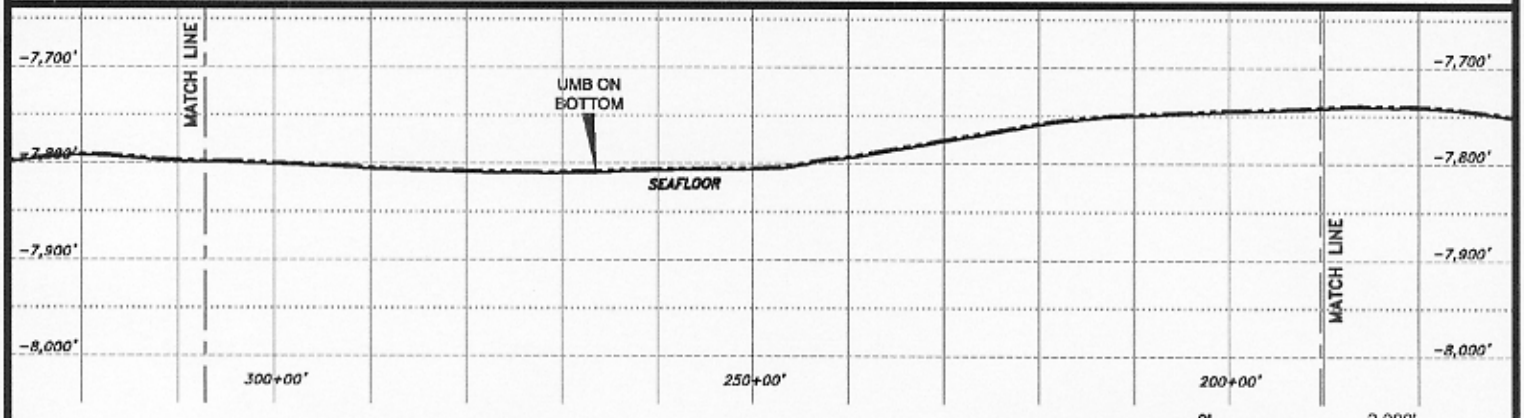
PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0066

JOB No: 7458-7589 | REVISED: 6/14/2005 | DATE: May 18, 2005

FILENAME: PRM7458_U.DWG

SHEET 3 of 8





PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

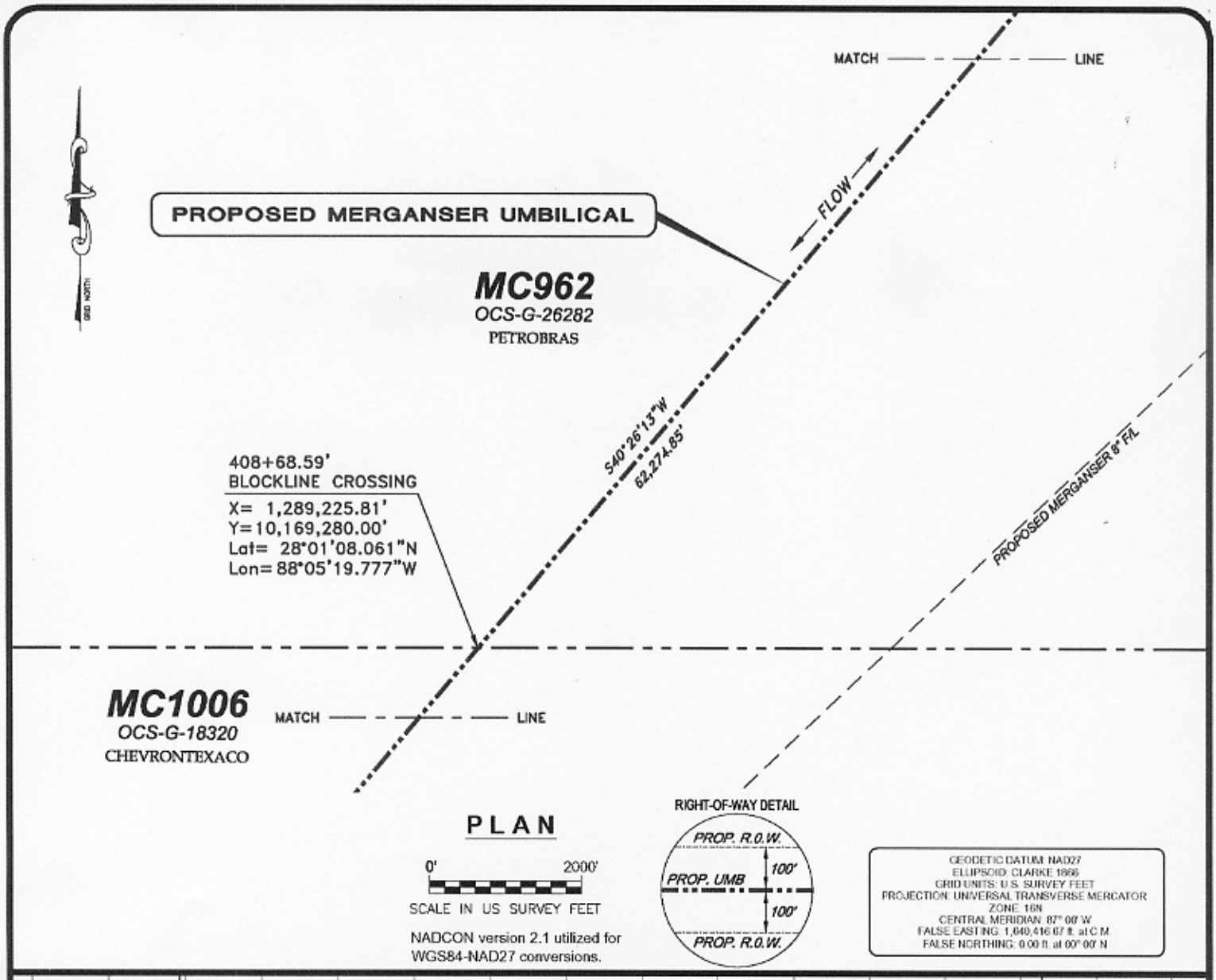
DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

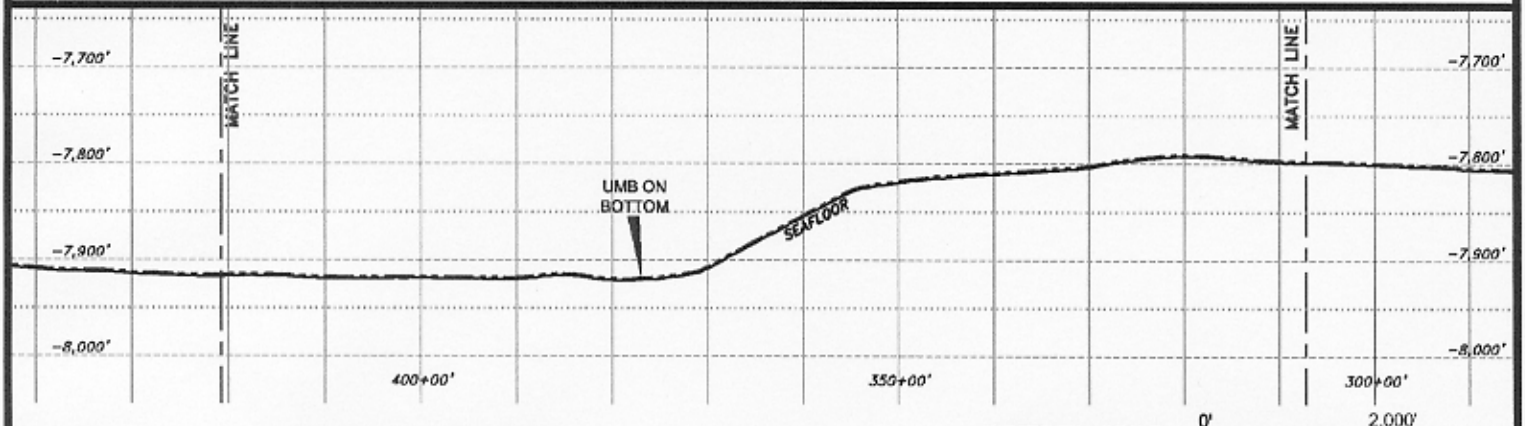
KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/14/2005	DATE: May 18, 2005
FILENAME: PRM7458_U.DWG		SHEET 4 of 8





PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

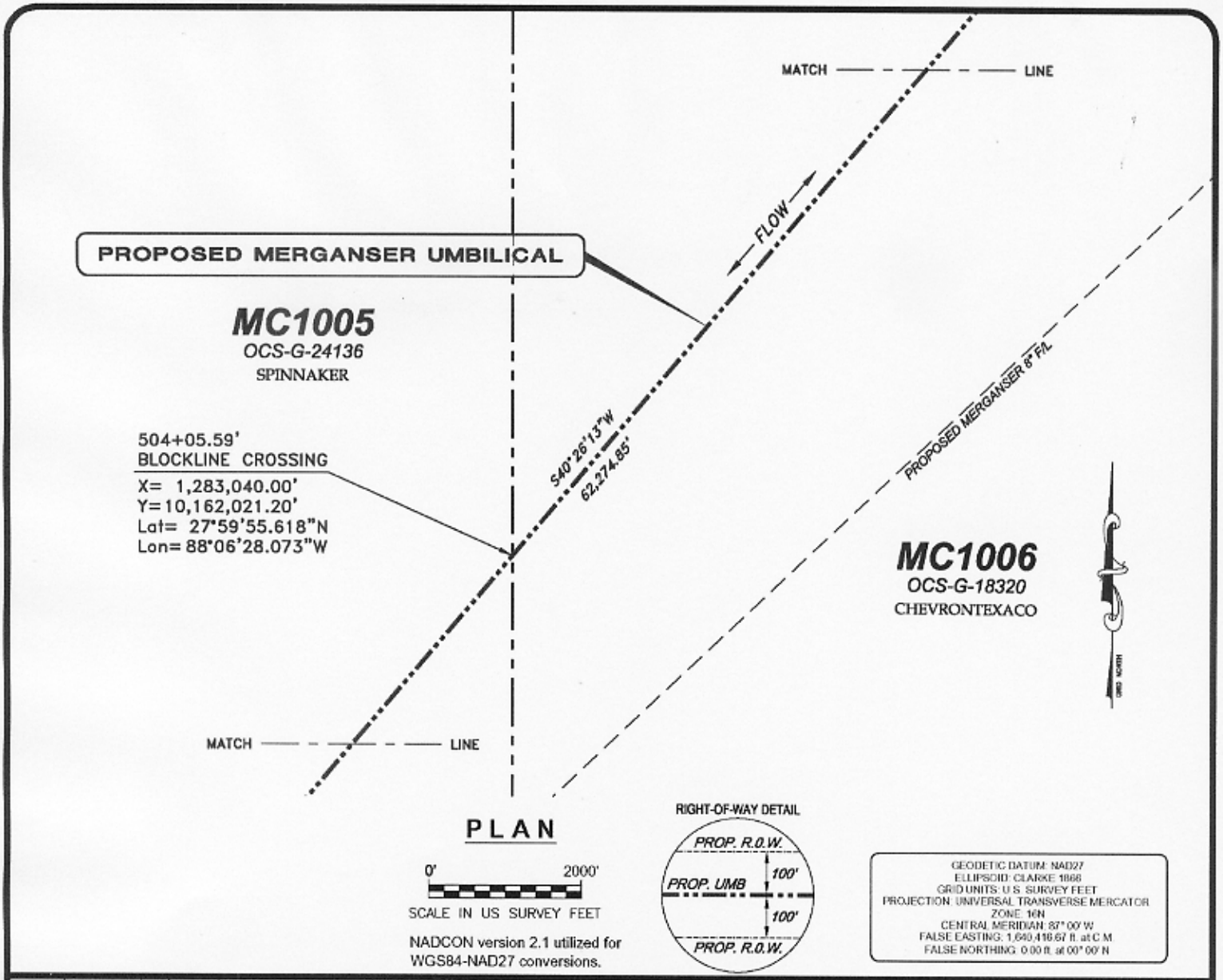
VERTICAL EXAGGERATION = 10

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/14/2005	DATE: May 18, 2005
FILENAME: PRM7458_U.DWG		SHEET 5 of 8



PLAN

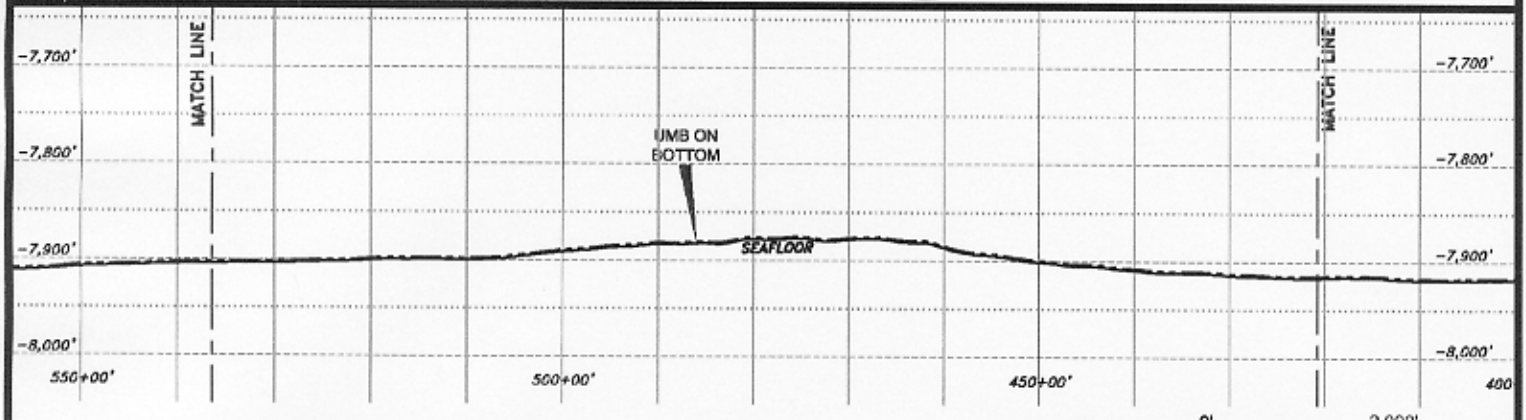
0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'

VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

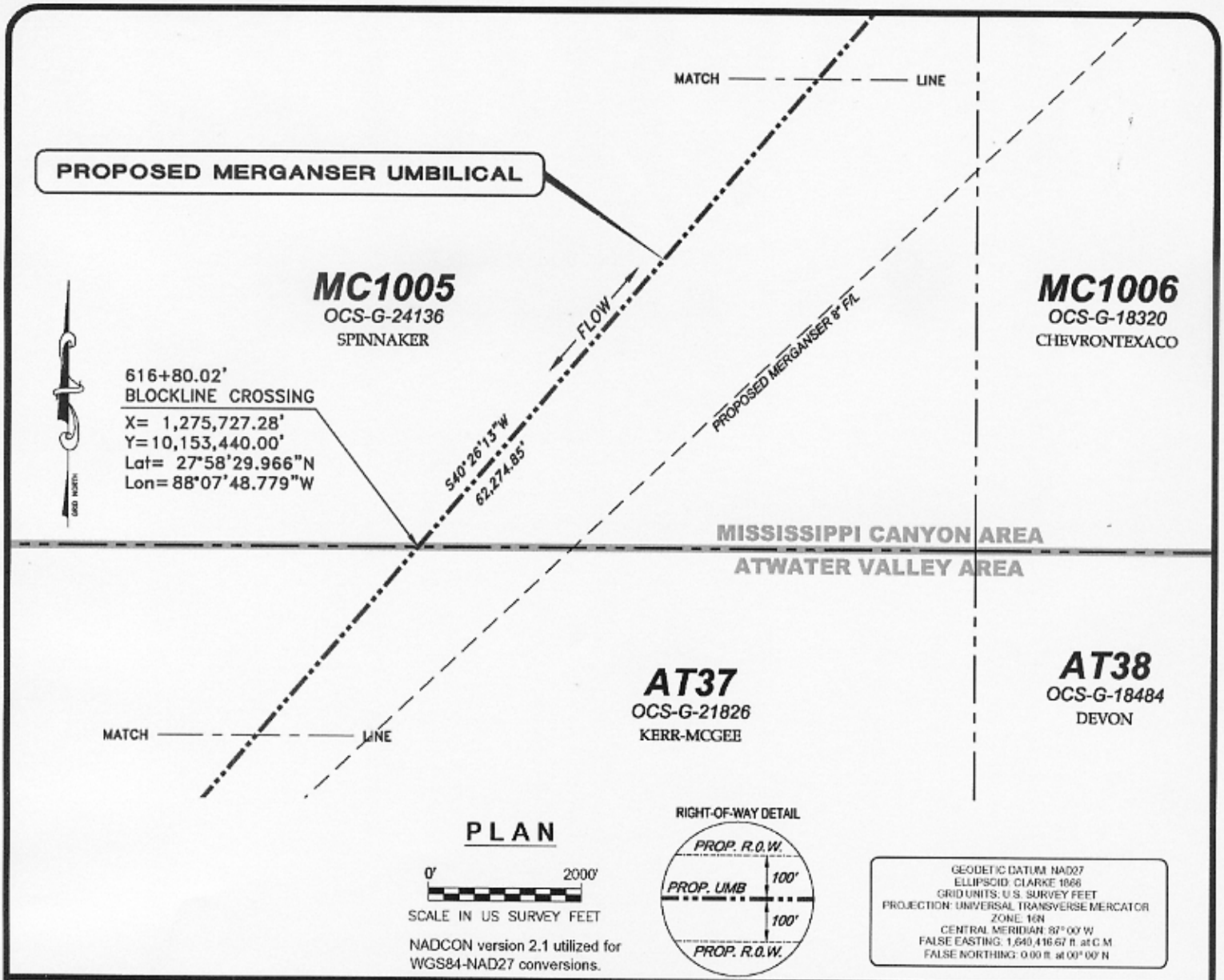
DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. Vaudie Saloom Road, Lafayette, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/14/2005	DATE: May 18, 2005
FILENAME: PRM7458_U.DWG		SHEET 6 of 8



PLAN

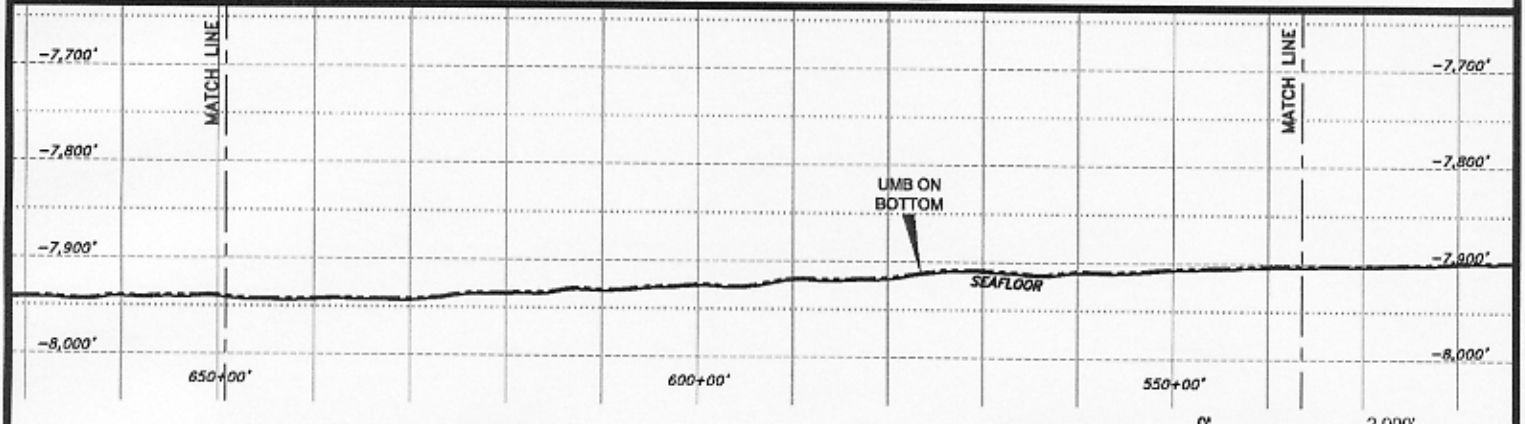
0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589	REVISED: 6/14/2005	DATE: May 18, 2005
FILENAME: PRM7458_U.DWG		SHEET 7 of 8

POINT	STATION	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE
PC2	730+16.47'	1,268,374.33'	10,144,811.61'	27°57'03.630"N	88°09'09.893"W
PT2	730+34.11'	1,268,368.36'	10,144,795.39'	27°57'03.669"N	88°09'09.958"W
PC3	730+74.84'	1,268,368.36'	10,144,754.66'	27°57'03.266"N	88°09'09.953"W
PT3	731+09.75'	1,268,347.70'	10,144,730.04'	27°57'03.020"N	88°09'10.181"W

MATCH LINE

AT36
OCS-G-21825
KERR-MCGEE

S40°26'13"W
62,274.85'
PROPOSED MERGANSER 8" F/L

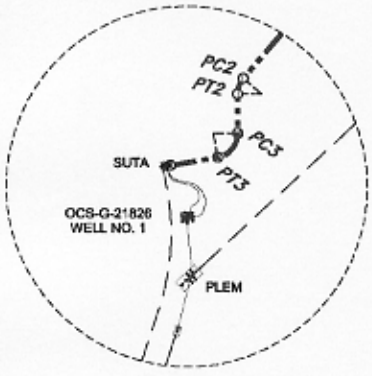
S80°00'15"W
50.00'

SOUTH
40.73'

FLOW

731+59.75' OCS-G-21826
WELL NO. 1 (SUTA)
X= 1,268,298.46'
Y= 10,144,721.36'
Lat= 27°57'02.929"N
Lon= 88°09'10.729"W

AT37
OCS-G-21826
KERR-MCGEE



DETAIL

SEE DETAIL

PROPOSED MERGANSER STEP-OUT UMBILICAL

PROPOSED MERGANSER INFIELD 8" F/L

OCS-G-21826 Well #2

PROPOSED MERGANSER UMBILICAL

TOTAL LENGTH = 73,159.75' = 13.86 statute miles

CURVE 3 DATA
PI 3
X= 1,268,368.36'
Y= 10,144,733.68'
R= 25.00'
T= 20.98'
Δ= 80°00'10"
L= 34.91'

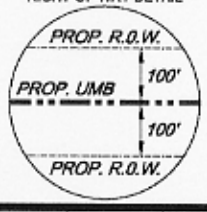
CURVE 2 DATA
PI 2
X= 1,268,368.36'
Y= 10,144,804.60'
R= 25.00'
T= 9.21'
Δ= 40°26'13"
L= 17.64'

PLAN

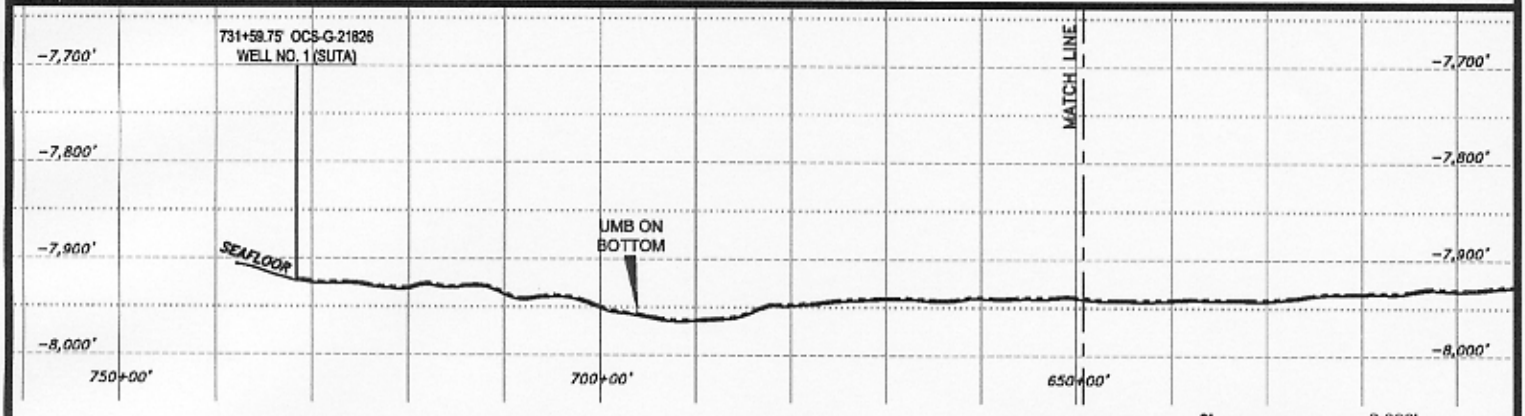
0' 2000'
SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 16N
CENTRAL MERIDIAN: 87° 00' W
FALSE EASTING: 1,640,416.67 ft at C.M.
FALSE NORTHING: 0.00 ft at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'
VERTICAL EXAGGERATION = 10

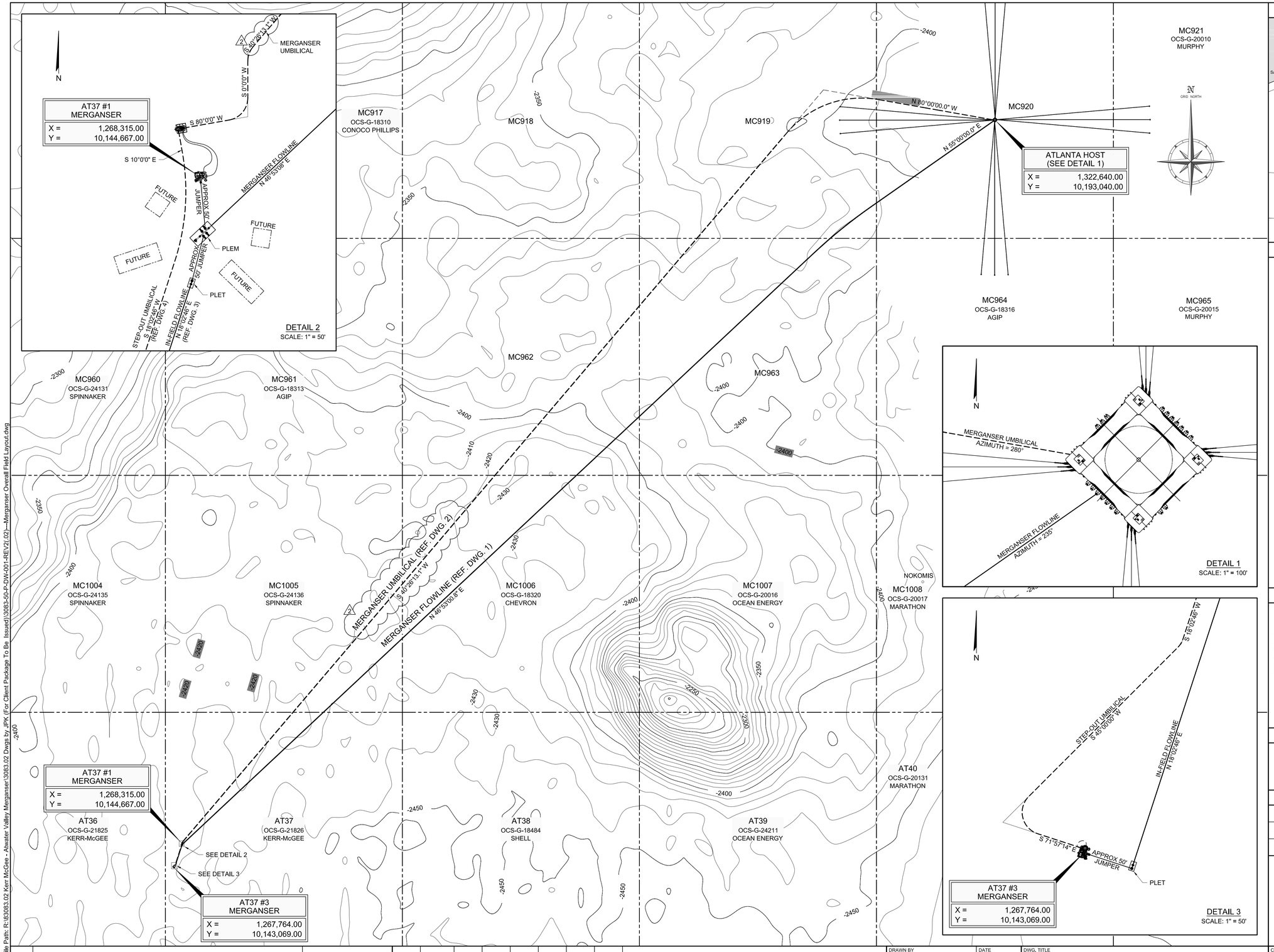
DATE: 06/14/2005 TIME: 11:17 FILENAME: J:\7458-7589\PERMITS\MERGANSER\PRM7458_U.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

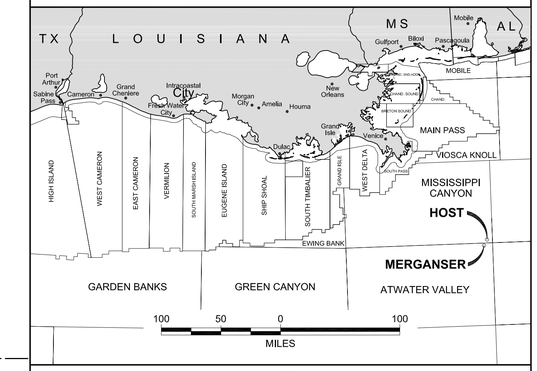
PROPOSED MERGANSER UMBILICAL
Block 920 Prop. Ind. Hub Platform, Mississippi Canyon Area
to
Block 37 Well No. 1 (SUTA), Atwater Valley Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 7458-7589 | REVISED: 6/14/2005 | DATE: May 18, 2005
FILENAME: PRM7458_U.DWG | SHEET 8 of 8



KEY MAP



NOTES

1. WATER DEPTHS SHOWN IN METERS, ALL OTHER UNITS IN FEET.

REFERENCE DRAWINGS

1	FLOWLINE ALIGNMENT SHEET	83083.02-50-P-DW-002
2	UMBILICAL ALIGNMENT SHEET	83083.02-50-P-DW-003
3	IN-FIELD FLOWLINE & STEP-OUT UMBILICAL ALIGNMENT SHEET	83083.02-50-P-DW-004
4	WELL #3 APPROACH DETAILS	83083.02-50-P-DW-005
5	WELL #1 APPROACH DETAILS	83083.02-50-P-DW-007
6	MASTER CONTROL STATION INTERFACING	83083.02-50-I-DW-001
7	ROXAR WET GAS FLOWMETER SIMPLIFIED INTERFACING	83083.02-50-I-DW-002
8	WELL #1 PIPING AND INSTRUMENTATION DIAGRAM (P&ID)	83083.02-50-J-DW-001
9	WELL #3 PIPING AND INSTRUMENTATION DIAGRAM (P&ID)	83083.02-50-J-DW-003
10	PLET PIPING LAYOUT	83083.02-50-U-DW-001
11	PLEM PIPING LAYOUT	83083.02-50-U-DW-002
12	SUBSEA JUMPER FROM WELL #1 TO PLEM	83083.02-50-U-DW-003
13	SUBSEA JUMPER FROM PLEM TO PLET	83083.02-50-U-DW-004
14	SUBSEA JUMPER FROM WELL #3 TO PLET	83083.02-50-U-DW-005
15	SURVEY SUPPORT DRAWING	83083.02-50-D-DW-001

LEGEND

FLOWLINE

UMBILICAL

GEODETIC DATA

PROJECTION:	UTM	DATUM:	NAD 1927
ZONE:	16 N	CENTRAL MERIDIAN:	87° W
SPHEROID:	CLARKE 1866	GRID UNITS:	US SURVEY FEET

1000 0 1000 2000
METERS

1 3/4 1/2 1/4 0 1
MILES

1,000 0 2,000 4,000 6,000 8,000 10,000
FEET

NO.	REFERENCE DRAWING TITLE	REF. DWG. NO.	REV	DATE	BY	ENG	CHK	PM	QA	CLIENT	DESCRIPTION
			2	03/07/05	JS AG	HP TP	RH RH	RH RH		TD TD	RE-ISSUED FOR DESIGN
			1	1/4/05	JS JS	HP HP	RH RH	RH RH		TD TD	ISSUED FOR DESIGN
			0	12/7/04	JS JS	HP HP	RH RH	RH RH		TD TD	ISSUED FOR DESIGN
			A	8/24/04	JS	HP	HP	HP		TD	ISSUED FOR INTERNAL REVIEW

DRAWN BY	J. STRANGE	DATE	8/24/04
ENGINEER	H. PALANY	DATE	8/24/04
PROJECT ENGINEERING MANAGER	R. HART	DATE	8/24/04
SCALE AT 'D'-SIZE	1" = 3,000'		

DWG. TITLE

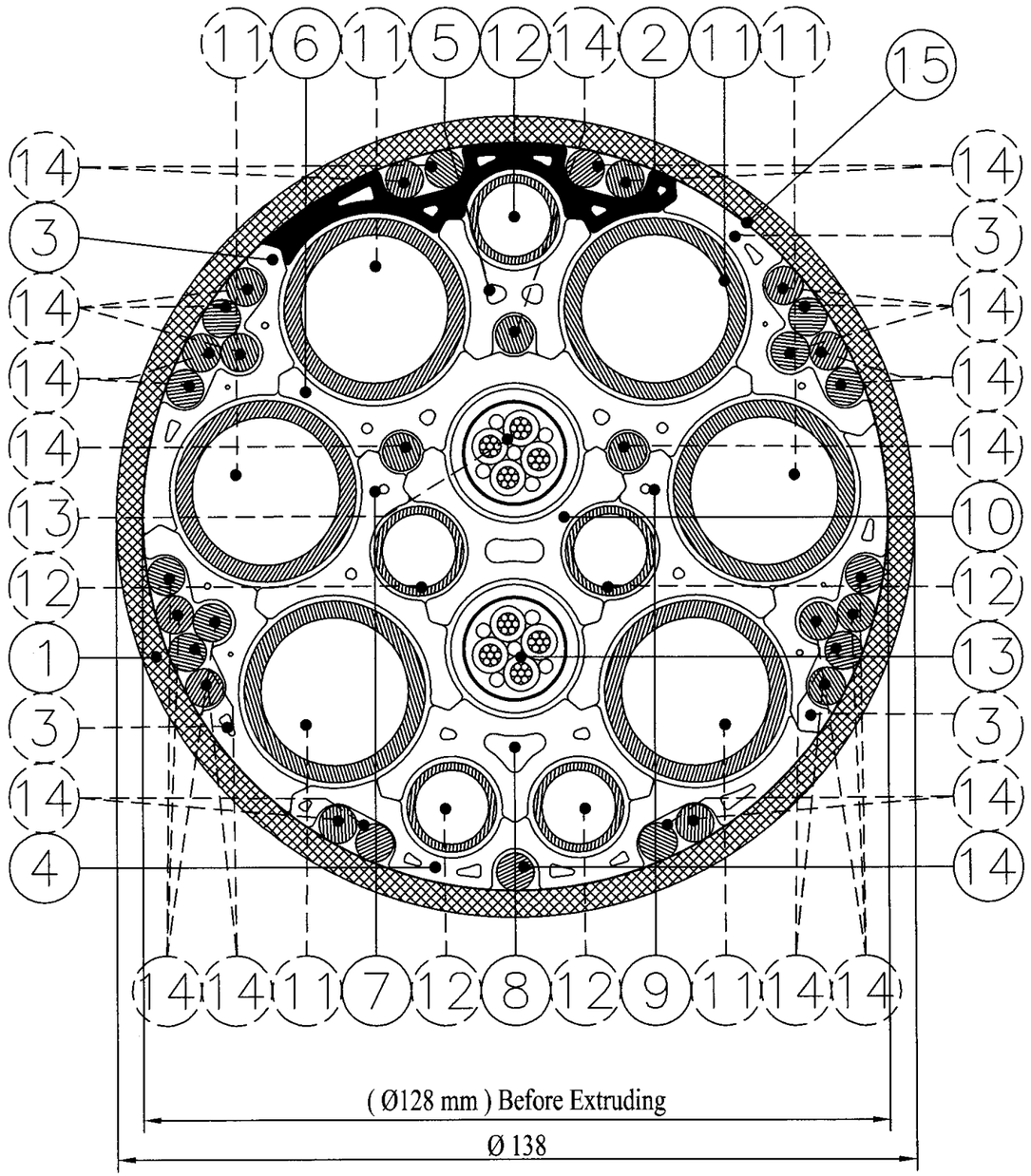
ATWATER VALLEY BLOCK 37
MERGANSER DEVELOPMENT
OVERALL FIELD LAYOUT

CLIENT: KERR-McGEE OIL & GAS CORP.

JP KENNY JPK

CAD No. 3083-50-P-DW-001-REV2	JOB No. 83083.02
DWG No. 3083-50-P-DW-001	REV. 2

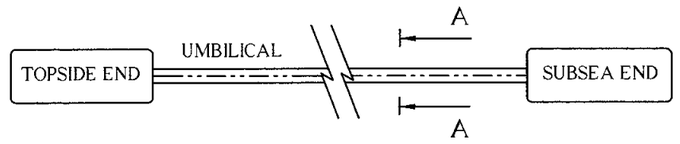
Mar 29, 2005 - 10:44am — File Path: R:\83083.02 Kerr McGee - Atwater Valley Merganser\3083.02 Dwgs by JPK (For Client Package To Be Issued)\3083-50-P-DW-001-REV2\(.02)—Merganser Overall Field Layout.dwg



SECTION A-A

Production and handling information

Bundling pitch length:	8 m
First end through closing machine in Mobile:	SUBSEA END
First end onboard installation vessel:	SUBSEA END



TECHNICAL DATA:

Umbilical weight in air, empty	245 N/m =16.7 lbf/ft
Umbilical weight in air, tubes fluid filled, hollow areas empty:	283 N/m = 19.3 lbf/ft
Umbilical weight in water, tubes fluid filled, hollow areas empty:	132 N/m = 9.0 lbf/ft
Umbilical weight in water, tubes fluid filled, hollow areas filled:	152 N/m = 10.4 lbf/ft
Design tension capacity of Umbilical	1070 kN = 240.57 klbf
Tensile Strength of Umbilical	1,390 kN = 312.48 klbf

4

Min. Bending Radius Operation without tension (MBR): $\eta = 0.67$ MBR= 7.1 m / 23.30 ft
Min. Bending Radius Installation without tension (MBR): $\eta = 1.0$ MBR= 4.78 m / 15.68 ft

Relative Specific weight of umbilical compared with seawater = 2.0

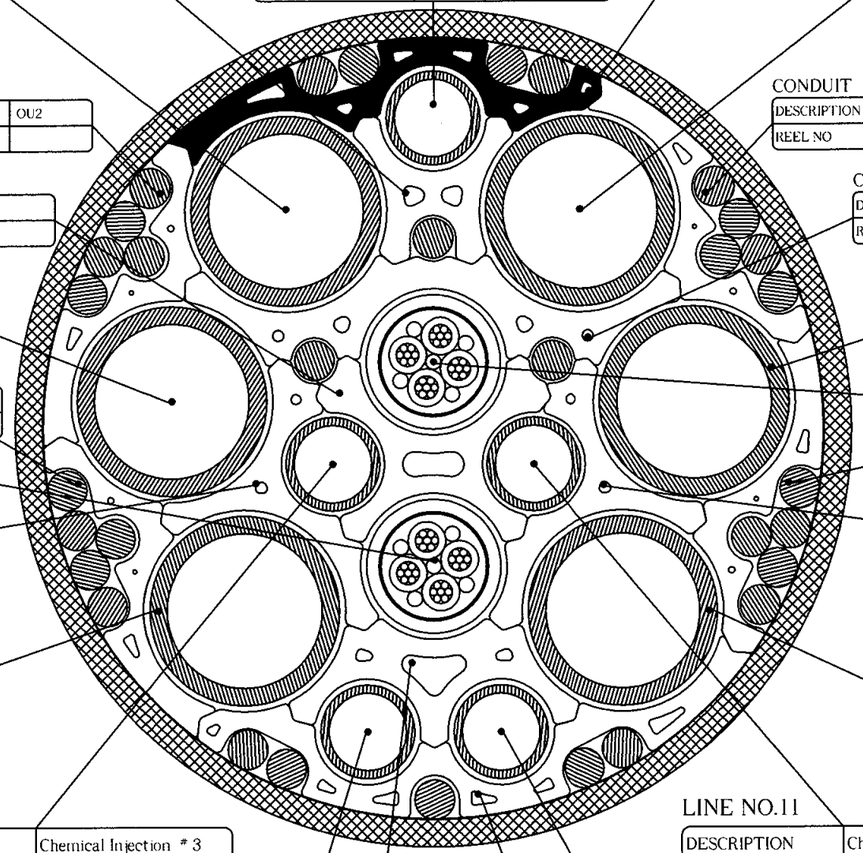
Axial stiffness:	5.34×10^5 N / 1.20×10^5 lbf
Bending stiffness:	3.84×10^4 Nm² / 9.30×10^4 lbf x ft²
Torsional stiffness:	2.96×10^4 Nm² / 7.14×10^4 lbf x ft²

Additional Information/Notes

Date 4/15/05	Drawn MK	Checked	Approved
Reason for issue: ISSUED FOR CONSTRUCTION			
Title: STEEL TUBE UMBILICAL CROSS SECTION LAYOUT KMG MERGANSER DYNAMIC		CAD Ref. Autocad	
		Scale NTS	Size B
Drawing no. 11-MB0226-00	Rev.no. 4	Project No. 1061	Sheet No. 1/3

Kværner Oilfield Products Inc.
Mobile, Alabama USA

KVÆRNER™



LINE NO.1

DESCRIPTION	HP Hydraulic Supply
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.7

DESCRIPTION	Annulus Access Line
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	MI1
REEL NO	

CONDUIT

DESCRIPTION	OU1
REEL NO	

LINE NO.3

DESCRIPTION	MEG Supply # 1
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.6

DESCRIPTION	MEG Supply # 4
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	IN1
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	MI2
REEL NO	

LINE NO.2

DESCRIPTION	LP Hydraulic Supply
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CABLE NO.2 (Power)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CABLE NO.1 (Signal)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	MI3
REEL NO	

CONDUIT

DESCRIPTION	MI5
REEL NO	

LINE NO.5

DESCRIPTION	MEG Supply # 3
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.4

DESCRIPTION	MEG Supply # 2
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.10

DESCRIPTION	Chemical Injection # 3
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	MI4
REEL NO	

CONDUIT

DESCRIPTION	OU3
REEL NO	

LINE NO.11

DESCRIPTION	Chemical Injection # 4
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.9

DESCRIPTION	Chemical Injection # 2
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.8

DESCRIPTION	Chemical Injection # 1
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

Additional Information/Notes

BEGINNING CROSS SECTION (SUBSEA END) 4

Date 4/15/05	Drawn MM	Checked JJC	Approved

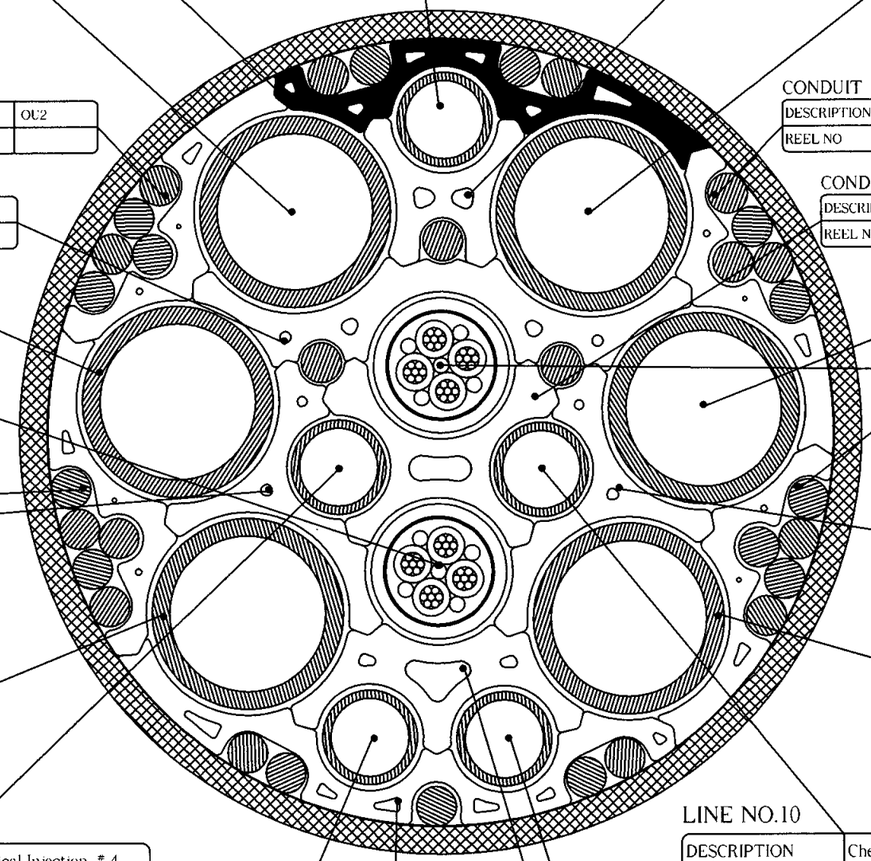
Reason for issue: ISSUED FOR CONSTRUCTION

Title: STEEL TUBE UMBILICAL CROSS SECTION LAYOUT KMG MERGANSER DYNAMIC

CAD Ref. Autocad			
Scale NTS	Size B		
Drawing no. 11-MB0226-00	Rev.no. 4	Project No. 1061	Sheet No. 2/3

Kværner Oilfield Products Inc.
Mobile, Alabama USA

KVÆRNER™



LINE NO.1

DESCRIPTION	HP Hydraulic Supply
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.2

DESCRIPTION	LP Hydraulic Supply
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.3

DESCRIPTION	MEG Supply # 1
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.4

DESCRIPTION	MEG Supply # 2
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.5

DESCRIPTION	MEG Supply # 3
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.6

DESCRIPTION	MEG Supply # 4
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.7

DESCRIPTION	Annulus Access Line
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.8

DESCRIPTION	Chemical Injection # 1
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.9

DESCRIPTION	Chemical Injection # 2
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.10

DESCRIPTION	Chemical Injection # 3
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.11

DESCRIPTION	Chemical Injection # 4
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CABLE NO.1 (Signal)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CABLE NO.2 (Power)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CONDUIT

DESCRIPTION	OU1
REEL NO	

CONDUIT

DESCRIPTION	MI1
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	MI2
REEL NO	

CONDUIT

DESCRIPTION	IN1
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	MI3
REEL NO	

CONDUIT

DESCRIPTION	MI5
REEL NO	

CONDUIT

DESCRIPTION	MI4
REEL NO	

CONDUIT

DESCRIPTION	OU3
REEL NO	

Additional Information/Notes

ENDING CROSS SECTION (TOPSIDE END) 4

Date 4/15/05	Drawn MK	Checked JJC	Approved

Reason for Issue: ISSUED FOR CONSTRUCTION

Title: STEEL TUBE UMBILICAL CROSS SECTION LAYOUT KMG MERGANSER DYNAMIC

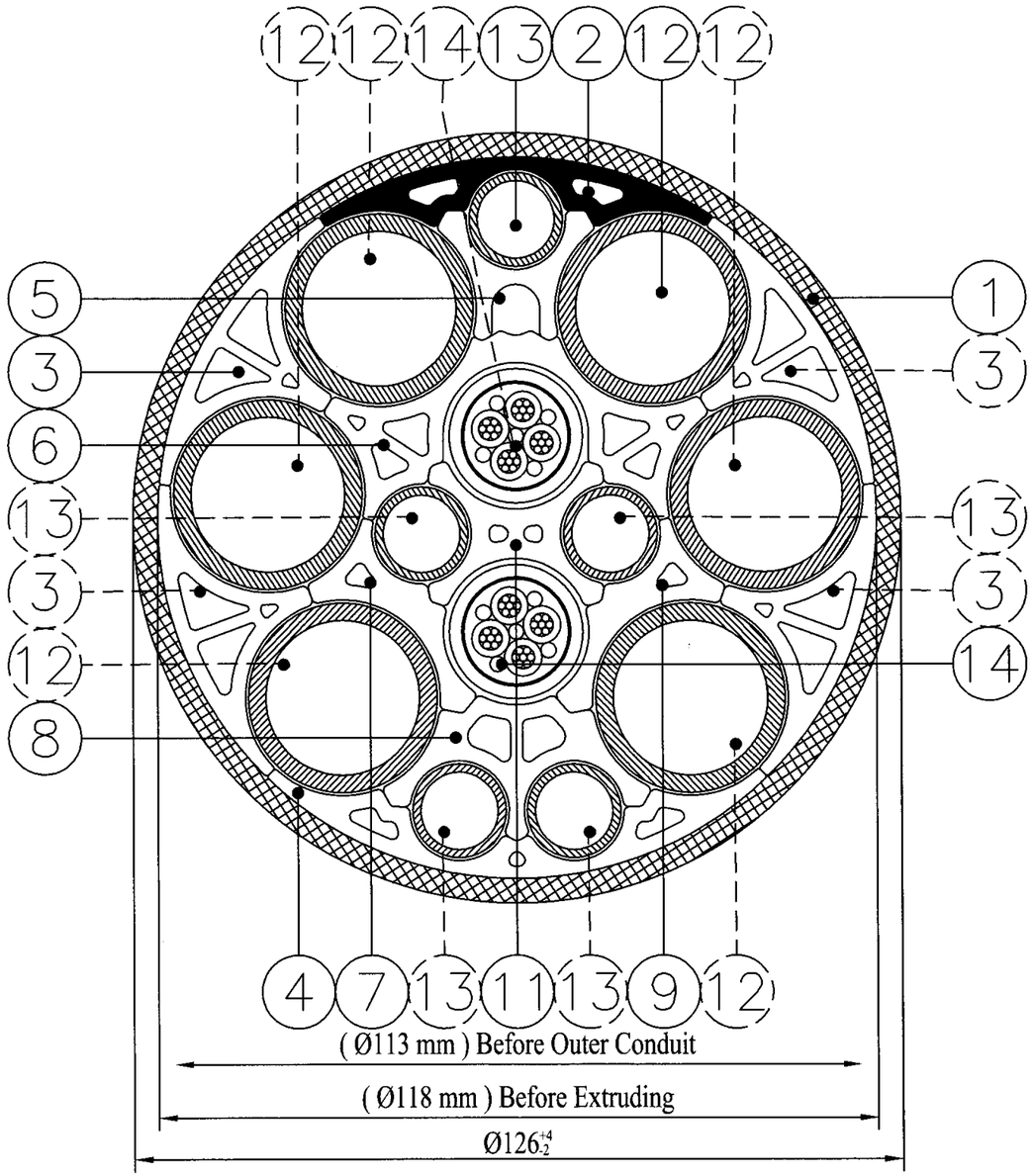
CAD Ref. Autocad		Scale NTS	Size B
Drawing no. 11-MB0226-00	Rev.no. 4	Project No. 1061	Sheet No. 3/3

Kvaerner Oilfield Products Inc.
Mobile, Alabama USA

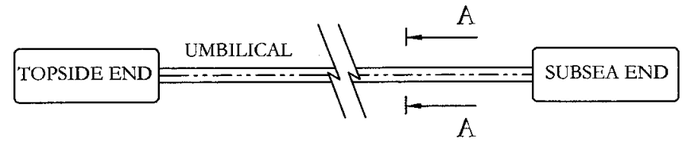
KVÆRNER™

Production and handling information

Bundling pitch length:	8 m
First end through closing machine in Mobile:	SUBSEA END
First end onboard installation vessel:	SUBSEA END



SECTION A-A



TECHNICAL DATA:

Umbilical weight in air, empty	216 N/m =14.8 lbf/ft
Umbilical weight in air, tubes fluid filled, hollow areas empty:	254 N/m = 17.4 lbf/ft
Umbilical weight in water, tubes fluid filled, hollow areas empty:	128 N/m = 8.7 lbf/ft
Umbilical weight in water, tubes fluid filled, hollow areas filled:	138 N/m = 9.5 lbf/ft
Design tension capacity of Umbilical	753 kN = 169.3 klbf
3 Tensile Strength of Umbilical	980 kN = 220.3 klbf
Min. Bending Radius Operation without tension (MBR): $\eta = 0.67$	MBR= 7.1 m / 23.30 ft
Min Bending Radius Installation without tension (MBR): $\eta = 1.0$	MBR= 4.78 m / 15.70 ft
Axial stiffness	$3.75 * 10^6$ N / $8.43 * 10^5$ lbf
Bending stiffness	$3.8 * 10^4$ Nm^2 / $9.21 * 10^4$ lbf*ft^2
Torsional stiffness	$2.9 * 10^4$ Nm^2 / $7.02 * 10^4$ lbf*ft^2

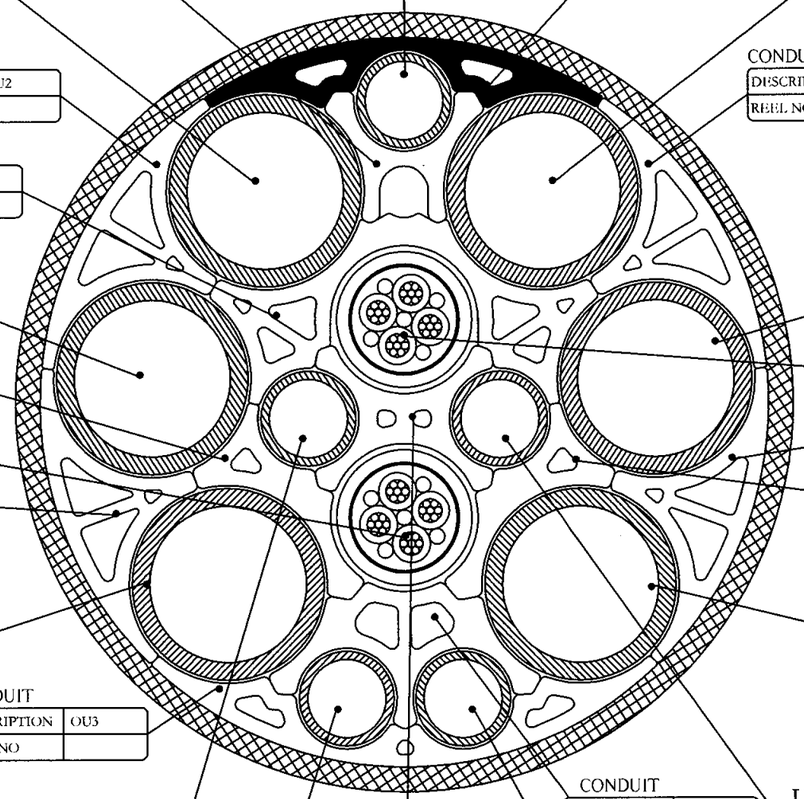
Relative Specific weight of umbilical compared with seawater = 2.1

Additional Information/Notes

Date 4/15/05	Drawn MK	Checked JSC	Approved
Reason for issue: ISSUED FOR CONSTRUCTION			
Title: STEEL TUBE UMBILICAL CROSS SECTION LAYOUT KMG MERGANSER STATIC			
Drawing no. 11-MB0227-00	Rev.no. 3	Project No. 1061	Sheet No. 1/3
CAD Ref. Autocad		Scale NTS	Size B

Kværner Oilfield Products Inc.
Mobile, Alabama USA

KVÆRNER™



LINE NO.1

DESCRIPTION	HP Hydraulic Supply
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.7

DESCRIPTION	Annulus Access Line
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	MI1
REEL NO	

CONDUIT

DESCRIPTION	OU1
REEL NO	

LINE NO.3

DESCRIPTION	MEG Supply # 1
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.6

DESCRIPTION	MEG Supply # 4
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	MI2
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

LINE NO.2

DESCRIPTION	LP Hydraulic Supply
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CABLE NO.2 (Power)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CONDUIT

DESCRIPTION	MI3
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CABLE NO.1 (Signal)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CONDUIT

DESCRIPTION	MI5
REEL NO	

LINE NO.5

DESCRIPTION	MEG Supply # 3
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	OU3
REEL NO	

LINE NO.4

DESCRIPTION	MEG Supply # 2
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.10

DESCRIPTION	Chemical Injection # 3
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	IN1
REEL NO	

CONDUIT

DESCRIPTION	MI4
REEL NO	

LINE NO.11

DESCRIPTION	Chemical Injection # 4
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.9

DESCRIPTION	Chemical Injection # 2
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.8

DESCRIPTION	Chemical Injection # 1
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

Additional Information/Notes

BEGINNING CROSS SECTION (SUBSEA END)

3

Date 4/15/05 | Drawn MK | Checked JBL | Approved

Reason for issue: ISSUED FOR CONSTRUCTION

Title: STEEL TUBE UMBILICAL CROSS SECTION LAYOUT KMG MERGANSER STATIC

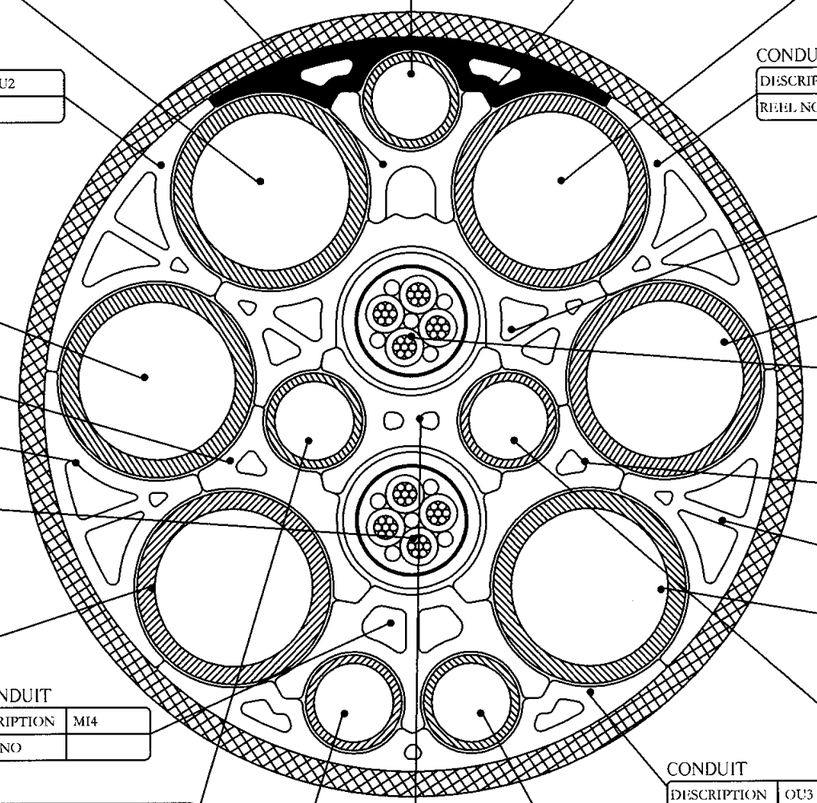
CAD Ref.: Autocad

Scale: NTS | Size: B

Drawing no.: 11-MB0227-00 | Rev.no.: 3 | Project No.: 1061 | Sheet No.: 2/3

Kværner Oilfield Products Inc.
Mobile, Alabama USA

KVÆRNER™



LINE NO.3

DESCRIPTION	MEG Supply # 1
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	OU1
REEL NO	

LINE NO.1

DESCRIPTION	HP Hydraulic Supply
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	MI1
REEL NO	

LINE NO.7

DESCRIPTION	Annulus Access Line
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.2

DESCRIPTION	LP Hydraulic Supply
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

LINE NO.6

DESCRIPTION	MEG Supply # 4
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	MI2
REEL NO	

CONDUIT

DESCRIPTION	MI5
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

CABLE NO.1 (Signal)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CABLE NO.2 (Power)

DESCRIPTION	TSAQ 10mm^2
OD	22.00mm
REEL NO.	
CABLE NO.	

CONDUIT

DESCRIPTION	MI3
REEL NO	

CONDUIT

DESCRIPTION	OU2
REEL NO	

LINE NO.4

DESCRIPTION	MEG Supply # 2
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.5

DESCRIPTION	MEG Supply # 3
ID	1" = 25.40 mm
OD	25.40+2X2.85 = 31,10 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	MI4
REEL NO	

LINE NO.10

DESCRIPTION	Chemical Injection # 3
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	OU3
REEL NO	

LINE NO.11

DESCRIPTION	Chemical Injection # 4
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

CONDUIT

DESCRIPTION	IN1
REEL NO	

LINE NO.8

DESCRIPTION	Chemical Injection # 1
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

LINE NO.9

DESCRIPTION	Chemical Injection # 2
ID	1/2" = 12.70 mm
OD	12.70+2X1.34 = 15,38 mm
DP	(10000psi = 690bar)
REEL NO	
TUBE NO	

Additional Information/Notes

ENDING CROSS SECTION (TOPSIDE END) 3

Date	Drawn	Checked	Approved
4/15/05	NK	ZBC	

Reason for issue: ISSUED FOR CONSTRUCTION

Title: STEEL TUBE UMBILICAL CROSS SECTION LAYOUT KMG MERGANSER STATIC

CAD Ref.: Autocad

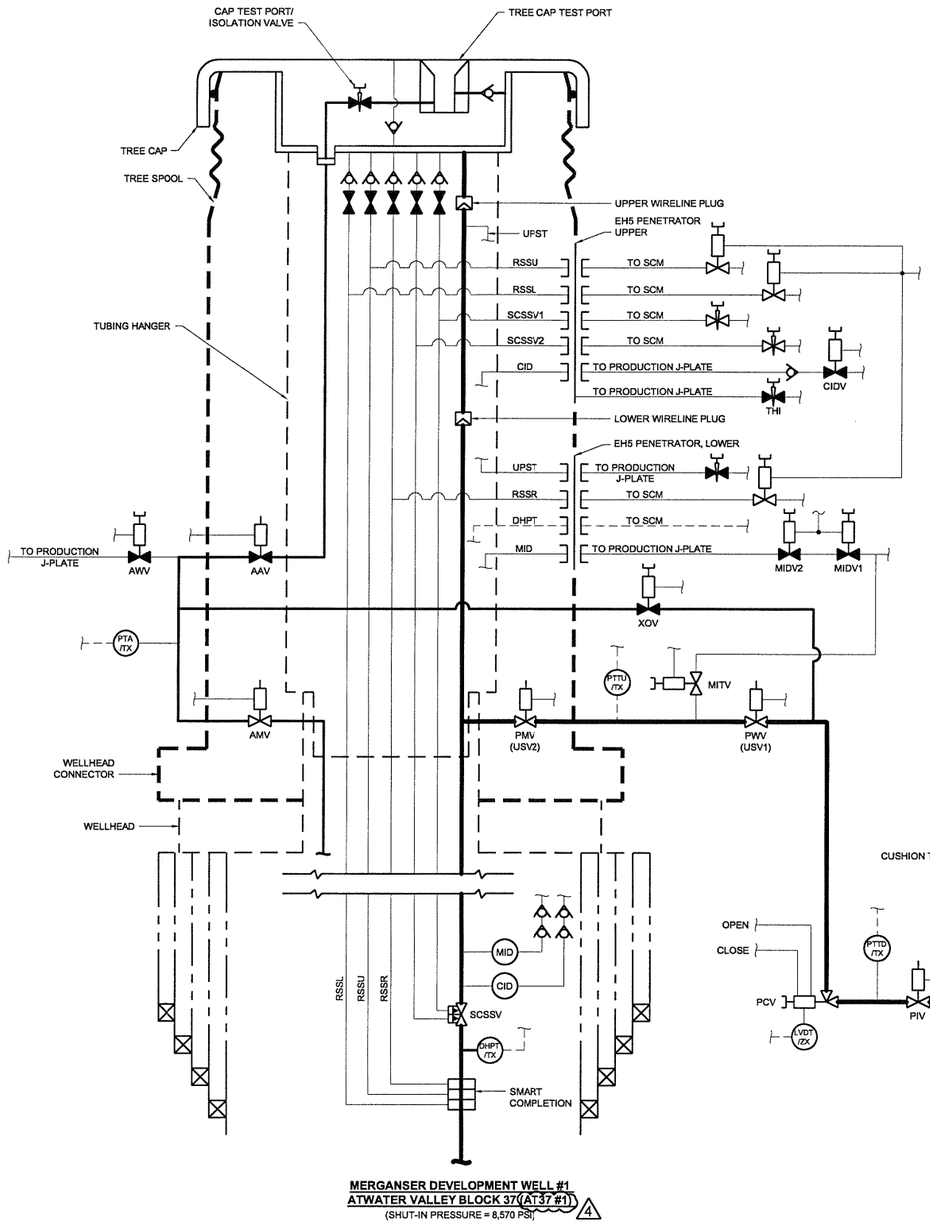
Scale: NTS | Size: B

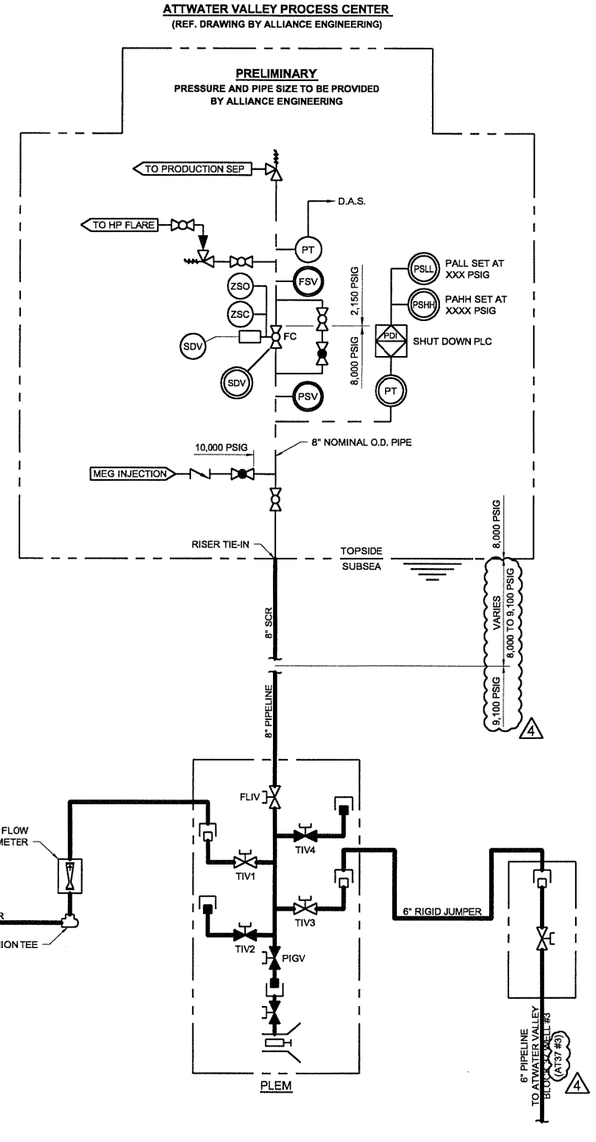
Drawing no.: 11-MB0227-00 | Rev.no.: 3

Project No.: 1061 | Sheet No.: 3/3

Kværner Oilfield Products Inc.
Mobile, Alabama USA

KVÆRNER™





NOMENCLATURE

AAV:	ANNULUS ACCESS VALVE
AMV:	ANNULUS MASTER VALVE
AWV:	ANNULUS WING VALVE
CID:	CHEMICAL INJECTION DOWNHOLE
CIDV:	CHEMICAL INJECTION DOWNHOLE VALVE
DHPT:	DOWN HOLE PRESSURE/TEMPERATURE TRANSMITTER
FLIV:	FLOWLINE ISOLATION VALVE
LVDT/ZX:	LINEAR VARIABLE DISPLACEMENT TRANSDUCER
MID:	MEG INJECTION DOWN HOLE
MIDV:	MEG INJECTION DOWN HOLE VALVE
MITV:	TREE MEG INJECTION VALVE
PCV:	PRODUCTION CHOKE VALVE
PIV:	PIGGING ISOLATION VALVE
PMV:	PRODUCTION MASTER VALVE
PTA/TX:	PRESSURE TRANSMITTER ANNULUS
PTTD/TX:	PRESSURE/TEMPERATURE TRANSMITTER (DOWNSTREAM)
PTTU/TX:	PRESSURE/TEMPERATURE TRANSMITTER (UPSTREAM)
PWV:	PRODUCTION WING VALVE
PSHH:	PRESSURE SWITCH HIGH HIGH
PSLL:	PRESSURE SWITCH LOW LOW
PSV:	PRESSURE SAFETY VALVE
PT:	PRESSURE TRANSDUCER
RSSL:	REMOTE SLIDING SLEEVE LOWER
RSSR:	REMOTE SLIDING SLEEVE RETURN
RSSU:	REMOTE SLIDING SLEEVE UPPER
SCM:	SUBSEA CONTROL MODULE
SCSSV:	SURFACE CONTROLLED SUBSURFACE SAFETY VALVE
SDV:	SHUT DOWN VALVE
THI:	TUBING HANGER ISOLATION
TIV:	TREE ISOLATION VALVE
USV:	UNDERWATER SAFETY VALVE
UPST:	UPPER PLUG SEAL TEST
XOV:	CROSS-OVER VALVE

LEGEND

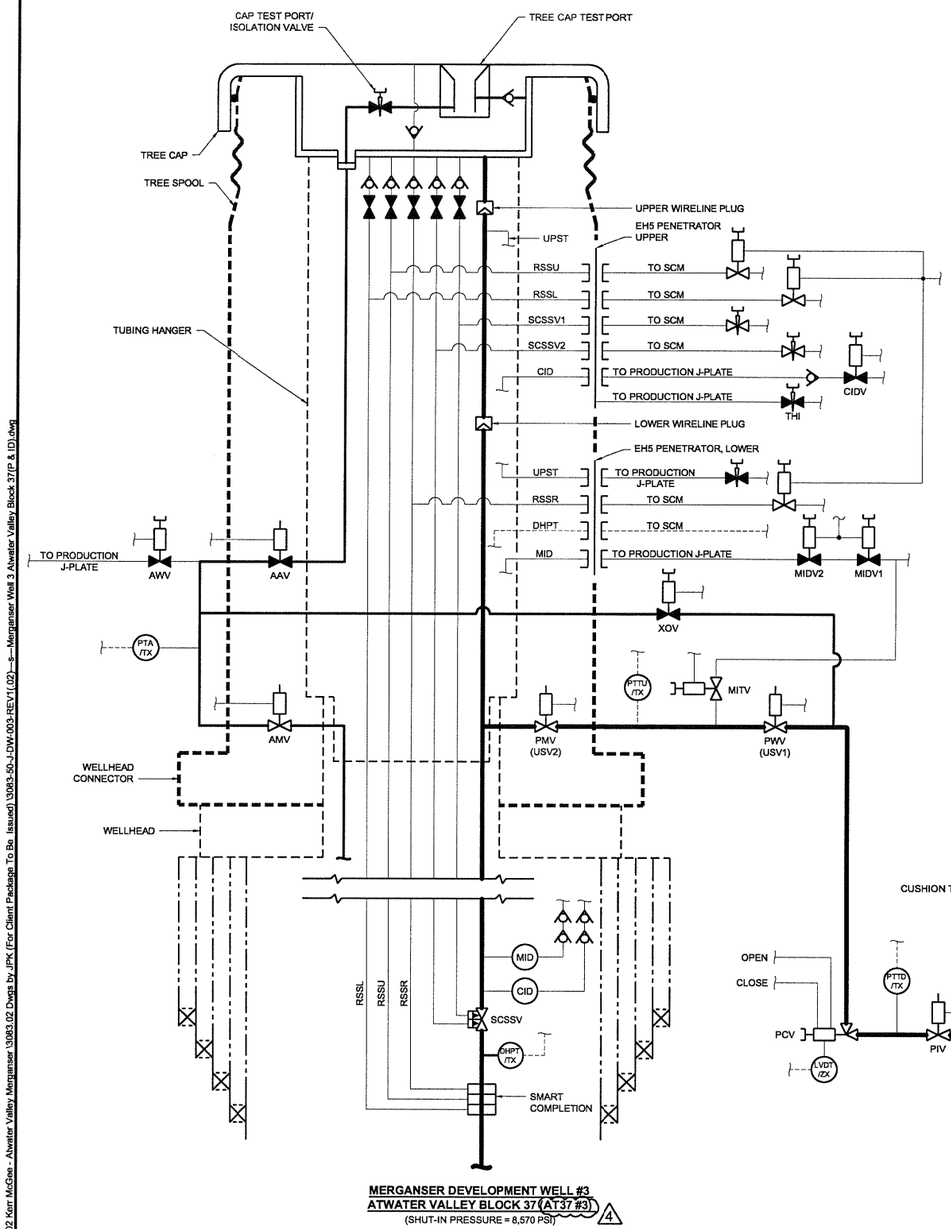
- ROV-OPERATED NEEDLE VALVE (OPEN) — (CLOSED)
- ROV OPERATED GATE VALVE (OPEN) — (CLOSED)
- BALL VALVE (OPEN) — (CLOSED)
- MANUAL-OPERATED GATE VALVE (CLOSED)
- DOWNHOLE SAFETY VALVE WITH DUAL HYDRAULIC CONTROLS
- CHECK VALVE
- BALL/SEAT CHECK VALVE
- HYDRAULICALLY-ACTUATED FAIL-CLOSED GATE VALVE WITH ROV OVERRIDE (OPEN) — (CLOSED)
- HYDRAULICALLY-ACTUATED FAIL-CLOSED GATE VALVE WITH LINEAR OVERRIDE (OPEN) — (CLOSED)
- HYDRAULICALLY-ACTUATED CHOKE VALVE WITH ROV OVERRIDE
- SPRING OPERATED PRESSURE SAFTEY VALVE WITH ANGLE BODY
- INSTRUMENT
- WET GAS FLOW METER
- RECEPTICLE WITH ROV HOT STAB
- LONG-TERM PRESSURE CAP (OPEN) — (CLOSED)
- WIRELINE PLUG
- CUSHION TEE
- ELECTRICAL LINE

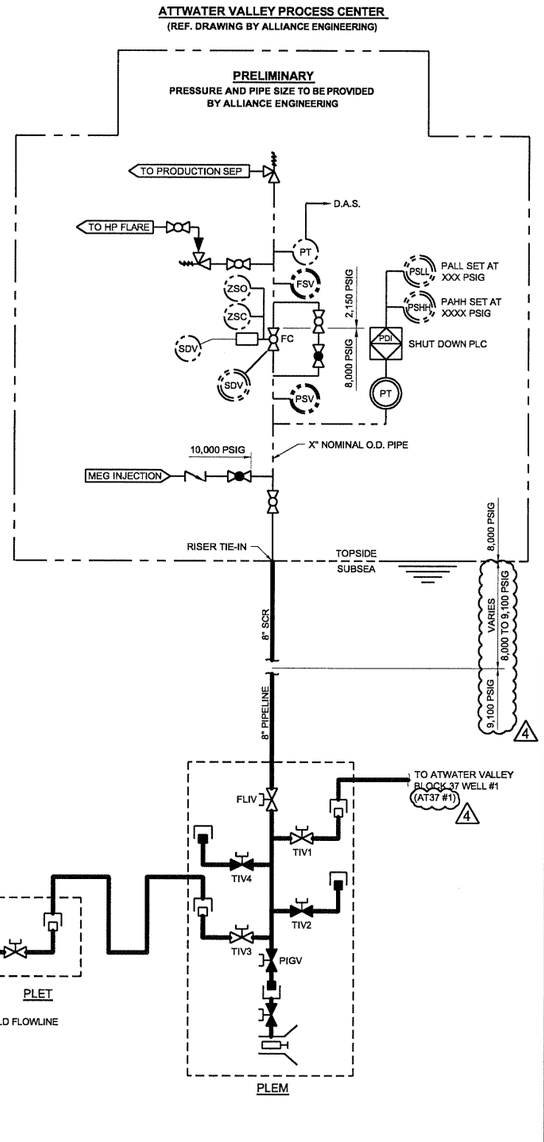
NO.	REFERENCE DRAWING TITLE	REF. DWG. NO.	REV	DATE	BY	ENG	CHK	PM	QA	CLIENT	DESCRIPTION
1	OVERALL FIELD LAYOUT	83083.02-50-P-DW-001	4	1/4/05	JS	HP	HP	RH		TD	RE-ISSUED FOR DESIGN
			3	11/22/04	AHG	HP	HP	RH		TD	RE-ISSUED FOR DESIGN
			2	118/04	JS	HP	HP	RH		TD	RE-ISSUED FOR DESIGN
			1	8/17/04	DP	HP	HP	RH		TD	RE-ISSUED FOR DESIGN
			0	8/17/04	JS	HP	RH	RH		BB	ISSUED FOR DESIGN

DRAWN BY: D. ZEPLIN	DATE: 3/16/04	DWG. TITLE: MERGANSER DEVELOPMENT WELL #1 ATWATER VALLEY BLOCK 37 PIPING AND INSTRUMENTATION DIAGRAM (P&ID)	CLIENT: KERR-McGEE OIL & GAS CORP.
ENGINEER: H. PALANY	DATE: 3/16/04		CAD No.: 3083-50-J-DW-001-REV4
PROJECT ENGINEERING MANAGER: R. HEIMANN	DATE: 3/16/04		DWG No.: 3083-50-J-DW-001
SCALE: NONE			JOB No.: 83083.02 REV.: 4

JP KENNY JPK

Jan 12, 2005 - 2:26pm — File Path: R:\83083.02 Kerr McGee - Atwater Valley Merganser\3083.02 Dwgs by JPK (For Client Package To Be Issued)\3083-50-J-DW-001-REV4(.02)—s—(was 3083-40, changed to 50 at Rev 1)—Merganser Well 1 Atwater Valley Block 37(P & ID).dwg





NOMENCLATURE

AAV:	ANNULUS ACCESS VALVE
AMV:	ANNULUS MASTER VALVE
AWV:	ANNULUS WING VALVE
CID:	CHEMICAL INJECTION DOWNHOLE
CIDV:	CHEMICAL INJECTION DOWNHOLE VALVE
DHPT:	DOWN HOLE PRESSURE/TEMPERATURE TRANSMITTER
MID:	MEG INJECTION DOWN HOLE
MIDV1:	MEG INJECTION DOWN HOLE VALVE (1)
MIDV2:	MEG INJECTION DOWN HOLE VALVE (2)
MITV:	TREE MEG INJECTION VALVE
PCV:	PRODUCTION CHOKE VALVE
PIV:	PIGGING ISOLATION VALVE
PMV:	PRODUCTION MASTER VALVE
PWV:	PRODUCTION WING VALVE
PSHH:	PRESSURE SWITCH HIGH HIGH
PSLL:	PRESSURE SWITCH LOW LOW
PSV:	PRESSURE SAFETY VALVE
PT:	PRESSURE TRANSDUCER
RSSL:	REMOTE SLIDING SLEEVE LOWER
RSSR:	REMOTE SLIDING SLEEVE RETURN
RSSU:	REMOTE SLIDING SLEEVE UPPER
SCM:	SUBSEA CONTROL MODULE
SCSSV:	SURFACE CONTROLLED SUBSURFACE SAFETY VALVE
SCSSV1:	SURFACE CONTROLLED SUBSURFACE SAFETY VALVE (1)
SCSSV2:	SURFACE CONTROLLED SUBSURFACE SAFETY VALVE (2)
SDV:	SHUT DOWN VALVE
THI:	TUBING HANGER ISOLATION
USV1:	UNDERWATER SAFETY VALVE (1)
USV2:	UNDERWATER SAFETY VALVE (2)
UPST:	UPPER PLUG SEAL TEST
XOV:	CROSS-OVER VALVE

LEGEND

- ROV-OPERATED NEEDLE VALVE (OPEN) — (CLOSED)
- ROV OPERATED GATE VALVE (OPEN) — (CLOSED)
- BALL VALVE (OPEN) — (CLOSED)
- MANUAL-OPERATED GATE VALVE (CLOSED)
- DOWNHOLE SAFETY VALVE WITH DUAL HYDRAULIC CONTROLS
- CHECK VALVE
- BALL/SEAT CHECK VALVE
- HYDRAULICALLY-ACTUATED FAIL-CLOSED GATE VALVE WITH ROV OVERRIDE (OPEN) — (CLOSED)
- HYDRAULICALLY-ACTUATED FAIL-CLOSED GATE VALVE WITH LINEAR OVERRIDE (OPEN) — (CLOSED)
- HYDRAULICALLY-ACTUATED CHOKE VALVE WITH ROV OVERRIDE
- SPRING OPERATED PRESSURE SAFTEY VALVE WITH ANGLE BODY
- INSTRUMENT
- WET GAS FLOW METER
- RECEPTICLE WITH ROV HOT STAB
- LONG-TERM PRESSURE CAP (OPEN) — (CLOSED)
- WIRELINE PLUG
- CUSHION TEE
- ELECTRICAL LINE

NO.	REFERENCE DRAWING TITLE	REF. DWG. NO.
1	OVERALL FIELD LAYOUT	83083.02-50-P-OW-001

REV	DATE	BY	ENG	CHK	PM	QA	CLIENT	DESCRIPTION
1	1/4/05	JS	HP	HP	RH		TD	RE-ISSUED FOR DESIGN
0	11/22/04	AHG	HP	HP	RH		TD	ISSUED FOR DESIGN
B	11/19/04	DZ	HP	HP	RH			RE-ISSUED FOR INTERNAL REVIEW
A	8/16/04	JS	HP	HP	HP		TD	ISSUED FOR INTERNAL REVIEW

DRAWN BY	D. PURDY	DATE 8/16/04
ENGINEER	H. PALANY	DATE 8/16/04
PROJECT ENGINEERING MANAGER	R. HEIMANN	DATE 8/16/04
SCALE	NONE	

DWG. TITLE

MERGANSER DEVELOPMENT WELL #3
ATWATER VALLEY BLOCK 37
PIPING AND INSTRUMENTATION DIAGRAM (P&ID)

CLIENT:	KERR-McGEE OIL & GAS CORP.
CAD No.	3083-50-J-DW-003-REV1
JOB No.	83083.02
DWG No.	3083-50-J-DW-003
REV.	1

JP KENNY JPK